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Air Publication 1269
3rd Edition 1938
Reprinted January 1940
incorporating A.L's 1, 2 & 3

MANUAL FOR MEDICAL AND DENTAL OFFICERS OF THE ROYAL AIR FORCE



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MANUAL FOR MEDICAL AND DENTAL OFFICERS OF THE ROYAL AIR FORCE

Issued for the information and guidance of all
concerned.

By Command of the Air Council

Gt. Brit. AIR MINISTRY
Published 1938



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ABBREVIATIONS

A.A.F.	Auxiliary Air Force.
A.F.	Army Form.
A.M.F.	Air Ministry Form.
A.M.Os.	..	..	Air Ministry Orders.
A.M.Ps.	..	..	Air Ministry Pamphlets.
A.O.C.	..	..	Air Officer Commanding.
A.O.C.-in-C.	..	..	Air Officer Commanding-in-Chief.
A.P.	..	..	Air Publication.
A.P.F.S.	..	..	Air Publications and Forms Store.
B.P.S.O.	..	..	Base Personnel Staff Officer.
C.A.	..	..	Civil Aviation.
C.D.	..	..	Confidential Document.
C.M.E.	..	..	Central Medical Establishment.
C.M.P.	..	..	Civil Medical Practitioner.
C.O.	..	..	Commanding Officer.
D.G.M.S.	..	..	Director-General of Medical Services.
D. of H.	..	..	Director of Hygiene.
D.P.M.O.	..	..	Deputy Principal Medical Officer.
D.P.M.O.(Hy.)	..	..	Deputy Principal Medical Officer (Hygiene).
E.M.O.	..	..	Embarkation Medical Officer.
i/c	..	..	in charge of.
I.D.O.	..	..	Inspecting Dental Officer.
K.R. & A.C.I.	..	..	King's Regulations and Air Council Instructions for the Royal Air Force.
M.O.H.	..	..	Medical Officer of Health.
M. of H.	..	..	Ministry of Health.
M. of L.	..	..	Ministry of Labour.
M.T.	..	..	Mechanical Transport.
N.C.O.	..	..	Non-commissioned Officer.
P.M.O.	..	..	Principal Medical Officer.
P.M.R.A.F.N.S.	..	..	Princess Mary's Royal Air Force Nursing Service.
R.A.F.	..	..	Royal Air Force.
R.A.F.O.	..	..	Reserve of Air Force Officers.
S.D.O.	..	..	Senior Dental Officer.
S.M.O.	..	..	Senior Medical Officer.
S.O.	..	..	Stationery Office.
U.K.	..	..	United Kingdom.
W.A.A.F.	..	..	Women's Auxiliary Air Force.

MANUAL FOR MEDICAL AND DENTAL OFFICERS OF THE ROYAL AIR FORCE

CHAPTER I

ORGANIZATION AND DUTIES

SECTION I.—GENERAL ORGANIZATION AND ADMINISTRATION

1. General.—The medical and dental services of the Royal Air Force are organized firstly for the prevention of disease and secondly for the care and treatment of the sick and injured. The officers are charged with :—

1. The duty of recommending to air and other officers commanding, verbally or in writing, any precautionary or remedial measures relating to billets, camps, dress, drills, duties, flying, food, hospitals, personnel, physical training, recreation, stations, transportation and all other matters which may, in their opinion, conduce to the preservation of health in the Royal Air Force (*see* K.R. & A.C.I., paras. 1457 and 1477).

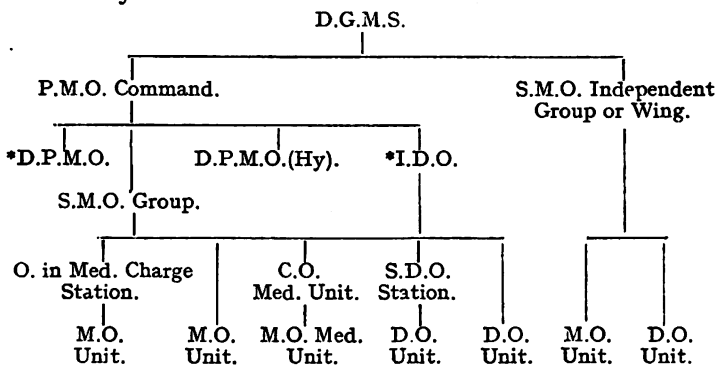
2. The professional treatment and care of the sick and injured, the administration of air force hospitals and sick quarters, the provision and replenishment of medical and dental equipment and the keeping of the prescribed accounts in respect thereof, and the preparation of medical records and statistics.

3. The command of all patients in hospitals, sick quarters, or sick in quarters, of medical units and establishments, and of such officers and airmen as may be attached thereto.

4. The training of medical and dental personnel (*see* paras. 135, 187 and K.R. & A.C.I., paras. 472A, 492, 503, 1460, 1500, and Air Publications 985 and 1112).

5. The determination of the physical fitness of candidates for commissions, of recruits and of others before entering air force service, and the examination and reporting upon the health of officers, airmen and others when required (*see* Chapter II.)

2. Channel of Administration.—The following table shows the normal channel of administration of the medical services of the Royal Air Force :—



* When borne on Establishment.

3. Duties of a Competent Medical Authority.—(*i.e.* Principal Medical Officer of a Command or Senior Medical Officer of an independent group or wing.) See K.R. & A.C.I., Chapter XIX, Section III.

4. Duties of a Deputy Principal Medical Officer.—See K.R. & A.C.I., para. 1465.

5. Duties of a Deputy Principal Medical Officer (Hygiene).—See K.R. & A.C.I., paras. 1466 to 1472.

Annual Hygiene Report.—He will prepare the annual report referred to in K.R. & A.C.I., para. 1472, on the following lines.

1. General conditions of the Command.—(*a*) Physical features and general character of stations in the Command.

(*b*) General conditions at stations, accommodation both in quarters and workshops, climate, entomology in relation to disease, facilities for recreation, effect of training on boys and the influence of any particular trade on the health of airmen.

2. Sanitary features of the Command.—(*a*) Water supply, mentioning salient points of the supply at any station, the number of water analyses made during the year, and steps that have been taken in respect of any defective supply.

(*b*) Drainage and sewage.

(*c*) Conservancy, including latrines, and scavenging.

(*d*) Food and drink—wholesomeness and condition of supply.

3. Sanitary administration of the Command.—Work of the R.A.F. sanitary assistants, hospital accommodation for infectious diseases, work done for the Royal Air Force, other than in air force laboratories, during the year.

4. Prevalence of and control over communicable disease.—Mentioning the prevalence of such disease, any outbreaks which have occurred and the steps taken to control such outbreaks.

5. Prevalence of and control over venereal disease.—Statement as to the prevalence of such disease and what steps have been taken to educate the men in matters of hygiene, to provide prophylactic centres, to ensure accurate and early diagnosis and treatment, to exclude persons suffering from venereal disease from participating in the preparing and serving of food.

6. Investigation of other disease.—The reports should contain an account of any influences threatening the health of the airmen in the Command, and suggestions for the removal of such influences.

7. General.—General information of hygienic interest, and copies of all special reports made during the year. A special note of camps which have been in temporary occupation during the year, including remarks on topography, accommodation, conservancy, water supply, bathing facilities, sullage, and condition of camp on evacuation.

One copy of the report will be retained by the P.M.O. of the Command and one copy forwarded to the Under Secretary of State, Air Ministry.

6. Duties of Consultants.—1. *Advisors to the Director-General of Medical Services.*—The Consultants are advisors to the Director-General of Medical Services on all technical questions relating to their subjects.

2. *Duties.*—They will be available for consultant work at the Central Medical Establishment and at other units as required.

3. *Training.*—They will make recommendations to the Director-General of Medical Services as to the selection of officers and airmen for specialised training in their special subjects and will collaborate with the training officer (medical) with regard to this selection of airmen. They will be responsible to the Director-General of Medical Services for the organization of this training and may be required to participate in the teaching.

4. *Research.*—They will be responsible to the Director-General of Medical Services for the initiation, organization and conduct of all research in connection with their subjects and in such other subjects as the Director-General of Medical Services may from time to time add thereto.

5. *Absence from Duty.*—During the absence of a consultant from duty either through leave or sickness no substitute will be sent from the Central Medical Establishment to carry out his normal routine visits to hospitals or other units except in case of emergency. At such periods of absence, which will be duly notified, the duties normally performed by a consultant when visiting a hospital will be delegated by the C.O. to medical officers of the hospital concerned as far as is practicable.

6. *Addresses.*—Consultants will ensure that the C.O.'s. of R.A.F. hospitals in the United Kingdom are in possession of their private addresses and telephone numbers (where applicable) and, when the consultants are not available, of the addresses and telephone numbers of the officers acting for them.

7. *The Consultant in Hygiene, Pathology and Tropical Medicine.*—The Consultant in hygiene, pathology and tropical medicine will supervise the technical conduct of all pathological laboratories, and will ensure that the pathological and bacteriological facilities for prophylaxis, diagnosis and treatment are adequate, accessible, prompt and economical. For this purpose he will, by previous arrangement with the competent medical authority concerned, visit each air force pathological laboratory in home commands at least once in every year, and will on these occasions have access to such personnel, material and documents as may be necessary for the prosecution of his duties. He will receive the annual laboratory reports of all air force pathological laboratories from which he will compile a summary. (See para. 5.)

8. *Consultants annual reports.*—Each consultant will render a report covering the work and research done in the R.A.F. in his particular subject for inclusion in the Annual Health Report. The report will be rendered each year to the C.O. of the Central Medical Establishment who will forward it direct to the Director-General of Medical Services not later than the 31st March of the following year.

7. Duties of a Senior Medical Officer of an Independent Group or Wing.—See K.R. & A.C.I., para. 1476.

8. Duties of a C.O. of a Hospital or Medical Unit.—This officer has the responsibilities of a C.O. of a unit as laid down in K.R. & A.C.I., paras. 52 to 73. (See para. 179.)

9. Duties of the Training Officer.—See K.R. & A.C.I., para. 1500.

10. Duties of the Medical Inspector of Recruits.—See K.R. & A.C.I., para. 1501 and A.P. 948.

11. Duties of the Inspecting Dental Officer.—See K.R. & A.C.I., para. 1560.

12. Dental Personnel.—These personnel will be controlled and administered by the appropriate competent medical authority or senior medical officer of the independent group or wing, as in the case of the medical personnel.

13. Princess Mary's R.A.F. Nursing Service.—Instructions regarding the status and duties of members of P.M.R.A.F. Nursing Service are contained in A.P. 1075.

SECTION II.—MISCELLANEOUS INSTRUCTIONS

14. The principal duties of medical and dental officers are laid down in K.R. & A.C.I., Chapter XIX, Section III. The attention of medical officers is in addition directed to the following :—

1. *Acquaintance with regulations.*—(K.R. & A.C.I., Chapter XV, Section I.)

2. *Correspondence.*—(K.R. & A.C.I., paras. 2190 to 2195 and A.P. 947.)

3. *Exercise of command.*—(K.R. & A.C.I., paras. 111 and 1077.)

4. *Flying training and air experience of medical officers.*—(K.R. & A.C.I., para. 1483.)

5. *Geneva Convention.*—(See Manual of Air Force Law, Appendix B.)

6. *Historical Records of medical units.*—(K.R. & A.C.I., paras. 2349 and 2350.)

7. *Hygiene.*—(K.R. & A.C.I., paras. 44, 58, 1830 and 1845.)

8. *Instructions regarding R.A.F. personnel in Army Medical Establishments.*—Instructions with regard to returns and procedure in connection with R.A.F. personnel in Army Medical Establishments are laid down in Regulations for the Medical Services of the Army 1938, Section XIV.

9. *Instructions regarding R.A.F. personnel in Royal Naval Medical Establishments.*—Instructions with regard to returns and procedure in connection with R.A.F. personnel in Naval Medical Establishments and Sick Bays are laid down in “Instructions for Royal Naval Hospitals and other Medical Establishments at Home and Abroad, 1927”, article 54, as amended by Admiralty Fleet Orders.

10. *Leave of absence.*—(K.R. & A.C.I., Chapter XVIII, Section I, and para. 1499.)

11. *Minor head injuries following boxing or football.*—(See A.P. 1269A.)

12. *Patents and designs.*—(K.R. & A.C.I., para. 862 and A.M.O. A.51/30.)

13. *Poisons and medicines in service institutes.*—Limitation of sale. (K.R. & A.C.I., para. 1771.)

14. *Post Mortem examinations.*—(a) A post mortem examination will not be carried out in cases which may involve an inquest unless the prior permission of the Coroner has been obtained.

(b) Medical officers posted for surgical duties should not, unless instructed by the Coroner, personally carry out post mortem examinations owing to the probable danger of carrying infection. There is no objection to their being present when another medical officer is carrying out the examination.

15. *Private health certificates.*—(K.R. & A.C.I., para. 1420.)

16. *Publication of articles.*—(K.R. & A.C.I., para. 1072.)

17. *Responsibility for ambulances.*—(K.R. & A.C.I., para. 1484.)

18. *Responsibility for material.*—(K.R. & A.C.I., paras. 85 and 2445.)

19. *Road accidents—disclosure of information.*—(See A.M.O. A.667/29.)

20. *Supply of Air Ministry Forms.*—A.M. Forms will accompany instructions from the Air Ministry in respect of examinations required to be carried out on such forms.

21. *Supply of Air Ministry Orders.*—(K.R. & A.C.I., para. 60.)

22. *Supply of medical equipment to dominion, colonial and foreign governments on repayment.*—(See A.M.O. A.194/37.)

23. *Treatment of subordinates.*—(K.R. & A.C.I., para. 1078.)

SECTION III.—BOOKS, PUBLICATIONS AND LIBRARIES

17. Care of Books and Publications.—Care will be exercised in the custody of books and publications provided for the use of serving personnel. Publications will be kept amended up to date in accordance with the latest lists announced from time to time in Air Ministry Orders (*see* K.R. & A.C.I., paras. 2287 to 2289 and 2291).

18. Publications to be kept by Sick Quarters, Hospitals and Competent Medical Authorities.—1. *Sick Quarters.*—The following publications will be kept at Station Sick Quarters :—

- (a) R.A.F. Manual of Cooking and Dietary. (A.P. 87.)
- (b) Medical Examination for Fitness for Flying (R.A.F. and Civil). (A.P.130.)
- (c) Scale of Medical and Dental Equipment. (A.P. 132.)
- (d) King's Regulations and Air Council Instructions for the Royal Air Force. (A.P. 958.)
- (e) Syllabus of Training of Airmen of the Medical and Dental Branches. (A.P. 985.)
- (f) Instructions for the Guidance of Medical Officers in Selection of Recruits for the Royal Air Force. (A.P. 1129.)
- (g) Manual for Medical and Dental Officers of the Royal Air Force. (A.P. 1269.)
- (h) Air Ministry Orders (complete set.)
- (i) Army Manual of Hygiene and Sanitation.
- (j) British Pharmaceutical Codex 1934 or Squire's Companion.
- (k) R.A.F. Manual, Defence against Gas. (A.P. 1510.)
- (l) Medical Manual of Chemical Warfare.
- (m) Nomenclature of Diseases.
- (n) Royal Army Medical Corps Training Manual.
- (o) The Tannic Acid Treatment of Burns. (Medical Research Council Special Report No. 141.)

2. *Hospitals.*—The following publications, in addition to those set out in Clause 1, will be kept at hospitals :—

- (a) Regulations for Supplies Services. (A.P. 112.)
- (b) Manual of Air Force Law. (A.P. 804.)
- (c) Regulations for Civilian Employees at Air Ministry Establishments. (A.P. 826.)
- (d) R.A.F. Equipment Regulations. (A.P. 830, Vols. I, II and III.)

(e) Regulations for the R.A.F. Reserve including the Reserve of Air Force Officers and men of the R.A.F. Reserve. (A.P. 938.)

(f) Regulations for the Auxiliary Air Force and County Associations. (A.P. 968.)

(g) Regulations for Princess Mary's R.A.F. Nursing Service. (A.P. 1075.)

(h) Priced Vocabulary of R.A.F. Equipment. (A.P. 1086.)

(i) Extracts from King's Regulations and Air Council Instructions affecting Promotion, Mustering and Trade Tests of Airmen. (A.P. 1112.)

(j) Priced List of Medical Equipment.

(k) Regulations for the Medical Services of the Army.

(l) Standing Orders for the Royal Army Medical Corps and Army Dental Corps.

(m) Table of Disability Assessments of Specified Injuries. (C.D.24.)

3. *Competent Medical Authorities.*—The following publications in addition to those set out in clauses 1 and 2 will be kept by competent medical authorities.

(a) R.A.F. Pocket Book. (A.P. 1081.)

(b) Mobilization Regulations for the Royal Air Force, Auxiliary Air Force and Royal Air Force Volunteer Reserve. (A.P. 1096.)

(c) R.A.F. War Manual, Part II. (A.P. 1301.)

(d) Memorandum on Medical Diseases in Tropical and Sub-Tropical Areas, 1930.

4. *Text Books for Training Purposes.*—(a) *Hospitals.*—The following books will be kept at hospitals for training purposes :—

(i) Anatomical Diagrams.

(ii) British Pharmacopœia.

(iii) Chemistry for Beginners. (Kingzett.)

(iv) First Lines in Dispensing.

(b) *Other units.*—The Medical Training Depot, Institute of Pathology and Tropical Medicine, and sick quarters detailed as training centres for Part II of the *ab initio* training for nursing orderlies, will be allowed such books and publications as may be sanctioned by the Air Ministry.

5. All books will be recorded on an inventory and signed for by the responsible officer. They will be produced if called for at inspections.

19. Books and Publications to be kept by Medical Personnel.
—(See K.R. & A.C.I. para. 2352.)

20. Medical and Dental Reference Libraries.—(1) *General.*—Small standard libraries, consisting of books of reference and certain periodicals dealing with professional subjects, will be established at commands and/or hospitals and certain other selected units at home and abroad. Each library will be available for the use of all medical and dental officers and members of P.M.R.A.F. Nursing Service serving in the command in which it is situated.

(2) *Requisition of books.*—Libraries will be supplied at the public expense with standard works on medical and allied sciences, and the books required will be selected and demanded from the Air Ministry (M.A.3.) in accordance with the procedure laid down in K.R. & A.C.I., para. 2285. Requisitions for the supply of books during the financial year will reach Air Ministry (M.A.3) not later than 1st December of that year. In addition, the regular supply of certain periodicals will be arranged by the Air Ministry.

3. *Librarian.*—The competent medical authority (or C.O. when the library is held at a hospital) will detail an officer to take charge of the library. The officer in charge of the library will be responsible for the custody of all books and periodicals issued, presented to, or purchased for, the library in accordance with K.R. & A.C.I., para. 882. He will keep a complete card inventory of the library on Form 503, and when the library is for the use of a command, will arrange for books to be distributed to all sick quarters.

4. *Loan procedure.*—Officers and members of P.M.R.A.F. Nursing Service requiring books and periodicals on loan from the library will demand them direct from the officer in charge of the library. The form of demand to be used will include an undertaking to be responsible for the safe custody of the books and/or periodicals and to return them to the library in good condition within fourteen days.

5. *Extension of loan procedure.*—Should they be required for a longer period, application for their retention for a further similar period will be made to the officer in charge of the library before the date on which the books or periodicals are due to be returned.

6. *Return of books.*—On the return of a book or periodical the officer in charge of the library will give a receipt showing that it is returned in good condition.

7. *Damage or loss*.—An officer or member of the P.M.R.A.F. Nursing Service who does not return a book or periodical or fails to return it in good condition, will be held responsible for its full cost (see K.R. & A.C.I., para. 2287).

8. *Audit*.—An annual audit will be carried out in accordance with K.R. & A.C.I., para. 882, clause 3 (c).

21. Medical and Dental Lending Library.—1. Commands and hospitals in the United Kingdom may become members of Messrs. Lewis's Lending Library at public expense by arrangement with the Air Ministry (M.A.3).

2. *Catalogue*.—A bi-monthly list of new books will be forwarded to competent medical authorities of commands in the United Kingdom for distribution.

3. *Subscriptions*.—Subscriptions are renewed annually on April 1st.

4. *Urgent exchange*.—When an urgent exchange is desired, the book may be returned direct by the subscriber (*i.e.* the competent medical authority) to Messrs. Lewis, but in these circumstances postage will be paid by the individual exchanging. In no circumstances will individual officers (other than subscribers) deal direct with Messrs. Lewis, nor Messrs. Lewis with them.

22. Hospital Recreational Libraries.—The C.O. of a hospital will detail an officer from the staff of the unit to take charge of the hospital recreational library, and will make such local arrangements as are possible for renewal and exchange of books with other service libraries at reasonably frequent intervals.

23. British Red Cross Society and Order of St. John Hospital Library.—Hospital recreational books and magazines are obtainable from the British Red Cross Society and Order of St. John Hospital Library for the use of patients in hospitals and sick quarters in the United Kingdom and abroad on direct application by the officer commanding or medical officer respectively. Parcels of books will be despatched by the library at six-monthly intervals or more frequently if specially requested. Books obtained in this manner are not returnable, but will be taken on charge in the hospital or sick quarters recreational library. In the case of new stations not already being supplied regularly, requests for books and magazines (titles will not be specified) may be addressed to the Secretary of the library at 48, Queen's Gardens, Lancaster Gate, London, W.2.

24. "Write Off" of Books in Recreational Libraries.—Books becoming unservicable will be surveyed and written off charge on the authority of the O.C. Hospital.

CHAPTER II

MEDICAL EXAMINATIONS, BOARDS AND
ATTENDANCE, SICK QUARTERS, HOSPITAL
TREATMENT, HOSPITAL ADMINISTRATION
AND DENTAL SERVICES

SECTION I.—MEDICAL EXAMINATIONS

30. General.—1. Care will be taken that the results, both positive and negative, of medical examinations are recorded on the appropriate forms. In addition, when a disability of a temporary nature is found, the cause and probable duration of unfitness will be indicated.

2. *Revision of Medical Categories.*—If the medical category of an individual examined is considered by the medical officer to require revision, arrangements will be made by him to regularize the position by referring the case to the competent medical authority for a medical board at the earliest opportunity. In the meantime, the duties for which the individual is eligible will be those appertaining to the lower category.

3. *Disclosure of Information.*—Where the forms appointed to be used by the regulations are marked "Confidential", no indication of their contents will be divulged to unauthorised persons (*see para. 64*).

31. Miscellaneous Examinations.—1. *Pilots posted to commands abroad.*—The health of all pilots newly posted to commands overseas will be inquired into by the unit medical officer as soon after their arrival as possible, and before they are required to undertake flying duties, with a view to ascertaining whether or not any deterioration has taken place during the period that has elapsed between their last medical examination and arrival at their new stations. Unless indicated as the result of enquiry, the special physical efficiency flying tests will not be carried out, but investigation will be made into the medical history on the voyage and the occurrence of gastro-intestinal disturbance, loss of weight, etc., supplemented by such medical examination as may be considered necessary.

2. *Medical Examinations in connection with Cases of Drunkenness.* (a) The proper meaning to be attributed to the word "Drunk" in a charge of drunkenness is that, through the intoxicating effect of liquor or drugs, the accused was unfit to be entrusted with his duty (*see Manual of Air Force Law, pages 28 and 29*). The responsibility for adducing evidence that the



accused was drunk (in this sense) rests with the officer or N.C.O. ordering the arrest, and for this reason a medical officer is not expected to express an opinion as to whether or not an individual is drunk. If, however, the accused is seriously ill or asks to see the medical officer on grounds of sickness, or if there is doubt as to whether the condition of the accused is due wholly or partly to sickness or injury and not to intoxicants, the medical officer will be sent for and will examine him as in ordinary sick cases.

(b) In dealing with cases of alleged drunkenness it will be for the C.O. (or court martial, as appropriate) to determine, in accordance with his, or their, service knowledge and the evidence of service witnesses, whether an officer or airman was in a fit state to do his duty, although there is nothing to debar a medical officer who has examined the accused from giving evidence as a witness as to whether the accused was "drunk" (as defined above).

(c) If a medical officer is called in to examine an officer or airman suspected of drunkenness, he must therefore make up his mind whether the condition of the accused can be accounted for wholly or in part by disease or injury. The accused may be suffering from some disease of which he is unaware, and serious results may follow if he is not kept under medical supervision; or a plea of sickness, injury or nervous disturbance may be brought forward at an investigation or trial, and the medical officer may be asked whether any such condition was actually present when he examined the accused. For these reasons the medical officer, when called upon to examine any person accused of drunkenness, should perform a complete and comprehensive examination at once, whether the accused complains of any disability or not. He should take a detailed history of the case, observe every feature of the individual's demeanour and behaviour, and examine every system of the body. Complete notes should be made at the time.

(d) The medical officer should form an opinion on each of the following points, and should be prepared to support such opinions or any of them by facts observed by himself at the time :—

(i) Whether the condition and behaviour of the accused is normal or abnormal.

(ii) Whether the accused is fit to perform his duty.

(iii) Whether, if the condition or behaviour of the accused is abnormal, such abnormality is wholly due to consumption of alcohol or drugs.

(iv) Whether the abnormality is partly due to consumption of alcohol or drugs.

(v) Whether the abnormality is wholly due to disease or injury.

(vi) Whether the abnormality is partly due to disease or injury.

(vii) If the abnormality is partly due to consumption of alcohol or drugs and partly to disease or injury, what is the relative importance of these factors?

(e) If the case comes before a court martial, the medical officer's summary of evidence should contain, in addition to any material facts observed by him, a summary of his opinion on such of the above points as arise from the circumstances of the case. (See also K.R. & A.C.I., paras. 1115 and 1116.)

3. Medical examination of personnel for training at the R.A.F. Anti-Gas School.—Personnel selected for courses at the Anti-Gas School will be medically examined prior to leaving their units. No officer or airman selected should be subject to:—

(a) Bronchitis, acute or chronic.

(b) Inflammatory conditions of the eyes, *e.g.* blepharitis or conjunctivitis.

(c) Nervous conditions, *e.g.* neurasthenia, claustrophobia.

Each individual found fit will be provided with a medical certificate as follows:—

“Certified that (Number)..... (Rank).....
(Name)..... has been medically examined and
found physically fit in all respects to attend a course of
instruction at the R.A.F. Anti-Gas School.

Date..... Signature of Medical Officer.....”

32. Officers.—A serving officer will be medically examined when necessary in accordance with the terms of K.R. & A.C.I., para. 1443. In the event of his being considered below the standard required of him in accordance with K.R. & A.C.I., para. 1430, action will be taken as indicated in K.R. & A.C.I., para. 1445.

33. Princess Mary's R.A.F. Nursing Service.—Members of P.M.R.A.F. Nursing Service will be medically examined in the same circumstances, where applicable, and in accordance with the procedure laid down for officers.

34. Cadets.—Cadets will be medically examined in the same circumstances, where applicable, and in accordance with the procedure laid down for officers. (See K.R. & A.C.I., para. 1443A.)

35. Candidates for Commissions.—The medical examination of candidates for commissions in the Royal Air Force will be conducted in accordance with the procedure detailed in para. 45 to 50.

36. Airmen.—The conditions and procedure governing the medical examination of airmen generally are laid down in K.R. & A.C.I., paras. 1446 and 1481. In addition, special medical examinations are required as follows :—

1. *Airmen on selection for courses* in accordance with K.R. & A.C.I., paras. 391, 1446 and 1454A.

Note.—(a) Care should be taken that airmen recommended for training as pilots are not assessed as fit for presentation to a medical board unless there is a reasonable probability of their acceptance (see K.R. & A.C.I., para. 506, clause 2).

(b) In order to save the expense of civil medical practitioner's fees the medical examination, as required by para. 257, clause 3 (b), of personnel for flying training at civil schools will be carried out at the unit immediately prior to the individual leaving for the flying training unit. It is important that Forms 48 in respect of such personnel be forwarded to Reserve Command as soon as this examination has taken place.

2. *Airmen detailed for Draft Abroad* on Form 624 in accordance with K.R. & A.C.I., para. 601.—(a) An airman, who in the opinion of the medical officer is unfit for service abroad will be disposed of as follows :—

(i) If temporarily unfit, he will be admitted to the nearest service hospital or retained at his unit pending the expiration of the period of temporary unfitness.

(ii) If more than temporarily unfit he will be admitted to the nearest service hospital, and if the C.O. of the hospital considers that he should be brought before a medical board for the purpose of being invalided, the procedure laid down in para. 89 will be followed.

(b) The medical officer of the unit will forward a report to the competent medical authority concerned stating the nature of the disability and the method of disposal of each airman found unfit. If an airman is retained at his unit under (a) (i) above, the medical officer will also state the anticipated period of unfitness.

3. *Airmen other than airman pilots, on loan to Dominion, Colonial or Foreign Governments*, on Forms 35 and 36, in accordance with K.R. & A.C.I., para. 1446, clause 1 (e) (see para. 253, clause 2).

4. *Air gunners and air observers* on Forms 42 and 43 in accordance with para. 257, clause 5, and K.R. & A.C.I., paras. 391, 507 and 1454.

5. *Armourers and fitter armourers* on Form 624 in accordance with K.R. & A.C.I., para. 391, clause 7.

6. *Airmen before participating in gliding, games, etc. after injury or illness*, on Form 624 in accordance with K.R. & A.C.I., para. 1455.

7. *Ex-apprentice clerks for commissions in the equipment branch*, on Forms 42 and 43 in accordance with A.M.O. A.172/37.

8. *Motor boat crew* on Forms 624 in accordance with K.R. & A.C.I., para. 391, clause 5.

9. *Prevention and detection of tuberculosis* in accordance with para. 128.

10. *Radiographers* on Form 39 in accordance with para. 445.

11. *Extension of service, prolongation of engagement, re-engagement and continuation in the service*, on Forms 78 or 82 in accordance with K.R. & A.C.I., Chapter X, Section V.

12. *Senior armament instructors* on Form 624 in accordance with K.R. & A.C.I., para. 391, clause 6.

13. *Transfer to the Reserve* on Forms 35 and 36 in accordance with K.R. & A.C.I., para. 653 (see para. 253, clause 3).

14. *Wireless operator mechanics* on Form 624 in accordance with K.R. & A.C.I., para. 391, clause 3.

37. Recruits.—The medical standards applicable to the entry of candidates for recruitment are laid down in A.P. 1129. (For Recruiting Regulations see A.P. 948.)

38. Families of R.A.F. Personnel.—Normally, medical examination from a service standpoint is not required, except in respect of the attendance of children at service schools (on Form 1927) or for the purpose of determining the fitness of the family to embark, in accordance with paras. 263, 483 and K.R. & A.C.I., para. 937, or with a view to transfer to the United Kingdom on medical grounds in accordance with para. 105.

39. Civilian Employees.—1. *General.*—The medical examination of civilian employees will be undertaken as necessary in accordance with K.R. & A.C.I., para. 1449, A.P. 826 and A.M.O. A.7/37. They will be examined as directed by the Air Ministry as to fitness for employment, and the results recorded on A.M. Form 857 (see para. 305). The results of examination on cases claiming compensation on account of injury will be recorded on A.M. Form 744.

2. *Instructors and fitters.*—Civilian personnel liable to be employed on airscrew swinging duties will be examined on initial employment and thereafter annually, a record being kept in the Morning Sick Book. Special attention will be paid to the following points :—

(a) History of Epilepsy, (b) Presence of Aneurism, Hernia, or Heart Disease, (c) Blood Pressure, (d) Fields of Vision (tested by hand movements).

3. *Mechanical transport drivers' Ophthalmic Examinations.*—Abroad, civilian drivers engaged locally will have their visual acuity tested before being accepted for employment, and both at home and abroad before being allowed to return to duty following absence on account of accident or illness, which might have affected their eyesight. Records of these examinations will be made in a special book kept at the medical unit or sick quarters for that purpose. (See A.P. 826.)

4. *Unestablished civilian employees engaged locally.*—In the case of unestablished civilian employees engaged locally, a certificate in accordance with the requirements of A.P. 826, Chapter I, Section II, only need be rendered, care being taken to note thereon any physical disability (e.g. hernia) which, although not sufficient to render the applicant unfit for employment, might subsequently prove of importance in connection with claims for compensation for injury (see paras. 296 and 315).

SECTION II.—MEDICAL BOARDS.

45. *General Organization.*—A medical board is, as a rule, held when an authoritative opinion is required concerning the medical condition of an individual. K.R. & A.C.I., para. 1432, enumerates the authorities empowered to convene medical boards and the circumstances in which they will normally be held. (See K.R. & A.C.I., para. 713, as regards flying personnel.) The medical standards for officers and flying personnel are fully set forth in A.P. 130.

46. *Composition and Proceedings.*—Except when otherwise provided, a medical board will normally consist of three medical officers, of whom the president will be of or above the rank of squadron leader. The board will be conducted in the presence of all its members and the patient to be boarded will invariably be present for some part of the proceedings, unless his medical condition contra-indicates this procedure.

47. *Travelling Expenses.*—(See K.R. & A.C.I., para. 3018, clause 2.)

48. The Central Medical Establishment and Headquarters Medical Boards abroad—Proceedings.—In recording the proceedings of the Central or Headquarters Medical Boards the following forms will be used :—

1. Officers and candidates examined in accordance with K.R. & A.C.I., para. 1440, clause 3 (a) (i) to (v) and (xi) who are—

(a) passed fit for full duties of the branch concerned—Forms 58, 826 and 827 ; or

(b) found temporarily unfit, or rejected as unfit for full duties of the branch concerned—Forms 58 and 827.

2. Officers and airmen in accordance with K.R. & A.C.I., para. 1440, clause 3 (b) (i) who are—

(a) passed fit to learn to fly—Forms 58, 657, 826 and 827 ; or

(b) found temporarily or permanently unfit to learn to fly—Forms 46, 47, 657 and 827.

3. Officers and cadets examined in accordance with K.R. & A.C.I., para. 1440, clause 3 (a) (vi), (vii) and (x) and (b) (ii)—Forms 46, 47, 657 and 827.

4. Officers examined in accordance with K.R. & A.C.I., para. 1440, clause 3 (a) (viii) when the finding of the previous board is :—

(a) concurred in—Forms 46, 47, 657, 827 and 847A ; or

(b) not concurred in—Forms 46, 47, 657 and 827.

5. Individuals examined in accordance with K.R. & A.C.I., para. 1440, clause 3 (a) (ix)—such forms as may be directed by the Air Ministry.

6. Warrant officers examined in accordance with K.R. & A.C.I., para. 1440, clause 3 (b) (iii), who are :—

(a) passed fit for the full duties of the branch concerned—Forms 657, 826 and 827 ;

(b) found temporarily or permanently unfit for the full duties of the branch concerned—Forms 46, 47, 657 and 827.

49. Candidates not called up for Immediate Training.—

1. An individual who has been accepted for flying training and is called up for training within three months of acceptance may be regarded as fit on production of a certificate, which may be signed by himself, stating that he has not undergone any physical deterioration.

2. An individual called up for training after the expiration of three months but within twelve months from the date of acceptance will be examined on a Form 42 (see para. 257).



3. An individual called up for training after the expiration of twelve months from the date of acceptance or if his condition is not considered satisfactory under clauses 1 or 2 above, will require to be medically boarded on Forms 826 and 827 (see para. 299).

50. Completion and Disposal of Forms.—1. When an officer or candidate is found unfit for full flying duties, the reason will be stated, and, if he is temporarily unfit, the treatment recommended (if any) together with the date on which re-examination is considered advisable, will also be stated.

2. Forms will be completed, signed and disposed of as laid down in Chapter III.

51. Necessity for Full and Accurate Completion of Forms.—

1. *General.*—When answering the questions on the various forms used to record the board proceedings, members of boards must bear in mind that the disposal of the officer or airman and the determination of his eligibility for a disability award are mainly based on the facts recorded and the opinions expressed by the board. Hence it is of paramount importance that the proceedings should record the facts on which the board have based their opinions, and the reasons for their conclusions. In addition to a description of the disabilities which have necessitated the board, the general condition of the officer or airman should be systematically investigated both by the medical officer in charge of the case and by the board, and the results (even though negative) recorded under appropriate classifications.

2. *Record of no other disability.*—The fact that no other disability is claimed or discovered will be recorded on the board proceedings. This will minimise claims made subsequent to discharge on account of disabilities which might otherwise have been overlooked at the time of invaliding. For the action to be taken by a board when it is considered that there is presumptive evidence of mis-statement by an airman on enlistment with regard to previous receipt of disability award, see para. 89, clause (d).

52. Definition of "Directly Attributable to Conditions of Service".—1. *Wounds and injuries sustained on duty.*—A wound or injury will normally be regarded as directly attributable to the conditions of air force service only when it is sustained during the actual performance of air force duty, and arises directly out of such performance.

2. *Organized games.*—An injury sustained whilst taking part in a game or physical recreation organised by or with the approval of the appropriate air force authority may be

regarded as directly attributable to the conditions of service, subject to the provisions laid down in K.R. & A.C.I., para. 3612. In this connection the reply of medical boards on Forms 46 and 47 to the question "Is it directly attributable to conditions of service?" will be "*See K.R. & A.C.I., para. 3612, clause 3.*"

3. *Disabilities other than wounds or injuries.*—(a) A disability, other than a wound or injury, will not be regarded as directly attributable to the conditions of service unless it arises directly out of the special conditions or circumstances incidental to air force service. Diseases, *e.g.* enteric fever, dysentery, malaria, etc., to which individuals are specially liable during service at stations abroad, may, if contracted during such service, be regarded as directly attributable to the conditions of service.

(b) Subject to clause 2 above, a disability will not be regarded as directly attributable to the conditions of service if, although contracted during the period of such service, it is due to the ordinary risks of indoor or outdoor life to which R.A.F. duty contributed no special liability.

4. *General.*—The foregoing definition of direct attributability to the conditions of service will be strictly observed by medical boards; but should it appear that there is clear justification for exceptional treatment in a particular case, a separate report to this effect may be submitted, the circumstances being fully stated.

53. Basis of Assessment.—The basis of assessment will be the degree of disablement estimated to be suffered by the individual as determined by comparison with the condition of a normal healthy man of the same age, *without reference to the earning capacity of the individual in his own or any other specific profession, trade, or occupation*, and without regard to any particular conditions or circumstances.

54. Method of Assessment of Disabilities.—Ordinarily assessment is made on a percentage basis and will be stated in multiples of ten where the degree of disablement is 20 per cent. or over; but in the case of an airman whose disability is estimated to be less than 20 per cent. the exact figure will be stated, *e.g.* 1 per cent. or 13 per cent. Where there are two or more separate and distinct disabilities, they will be assessed both separately and collectively, the collective assessment not necessarily being the sum of the rates at which each separate disability is assessed. The assessments of medical boards for purposes of disability retired pay, disability pension, etc., will represent the average degree of disablement during the period covered by the assessment.

55. Assessment of Surgical Disabilities.—Where applicable, assessment will be made in accordance with the "Table of Disability Assessments of Specified Injuries" (C.D.24). In cases of disablement other than those exactly provided for in the table, the assessment will be made at the percentage which is held to correspond most closely to the degree of disablement represented by the disability.

56. Disability arising in connection with Great War Service.—In the case of disability arising in connection with the Great War (*see* K.R. & A.C.I., "Explanation of Terms") the board will state whether such is attributable to, or if not, whether aggravated by service during that period.

57. Cases of Aggravation of Non-Attributable Disability by Conditions of Service subsequent to the Great War.—

1. Besides the cases of direct attributability referred to in para. 52 above, there may be cases in which the disability, though not directly attributable to post-war air force service, would not have produced the same disabled condition but for specific conditions of such service. When the opinion of the board is to this effect, the board will be governed by the following working rules :—

(a) The original disease or injury must have either arisen in the service or be of such a nature as might easily have escaped observation on entry, even by most careful examination ; and

(b) The condition from which the individual is suffering must be due definitely to conditions of service and not such as might arise from the original disease or injury by the mere passage of time.

2. Although the words "aggravation" and "aggravated" do not appear in the post-war pension regulations, cases where both of the above conditions are fulfilled may be regarded for purposes of disability awards and in deciding the entitlement of officers and members of P.M.R.A.F. Nursing Service to sanatorium treatment at public expense, as directly attributable to conditions of service, subject to Air Ministry confirmation. If, however, it is found subsequently that the effects of aggravation by conditions of service have passed away, the disability, though it may still exist and even be considerable, will no longer be regarded as attributable.

58. Opinion of Medical Board.—Medical boards when recording their opinions as to causation of a disability, degree of disablement, or fitness for service, will be careful not to allow their decisions to be influenced unduly by the proceedings of previous medical boards. In the event of their disagreeing

with the opinions expressed by previous boards, they will state the grounds on which they base their disagreement. Care also will be exercised by boards in recording accurately any specific conditions of service to which in their opinion a disability is due.

59. Classification of Patients transferred to the United Kingdom.—1. *Definition of classification.*—Medical boards transferring patients from overseas to the United Kingdom will classify them as either :—

- (a) Class " A " = Requiring hospital accommodation, or,
- (b) Class " B " = Not requiring hospital accommodation.
(See para. 318.)

2. *Class " A " cases*—The following cases will always be regarded as class " A " :—

- (a) Mental.
- (b) Pulmonary tuberculosis.
- (c) Infectious.
- (d) Requiring special diet.
- (e) Airmen with disabilities of arm or leg which prevent them from fetching their own hammocks, slinging them to the deck above, getting into or out of them and putting them away in the morning, which duties are encumbent on class " B " cases.

3. *Reclassification.*—The classification " A " or " B " is not necessarily final, as the condition of a patient may alter materially after the board has been held. In this case reclassification from " A " to " B " or *vice versa*, will be made by the C.O. of the hospital concerned, a notification being sent to the competent medical authority for the information of the headquarters.

4. *Accommodation of class " A " cases.*—It should be noted that class " A " accommodation is nearly always limited, and that cases so classified may not be allotted passages which would have been available had they been classified as class " B ".

5. *Patients travelling as first- or second-class passengers.*—In the case of first- and second-class patients who are classified as " A ", medical boards will state in the proceedings whether ordinary accommodation is suitable or whether hospital accommodation is essential.

6. *Class of accommodation.*—Invalids may be assigned, on medical recommendation, a superior class of accommodation to that to which they are normally entitled (see K.R. & A.C.I., para. 3052, clause 3).



60. Transfer of Patients from Commands abroad.—1. In the event of a patient being transferred by hired sea transport from a hospital to the United Kingdom, Form 48, together with the board proceedings, will be despatched to the Officer Commanding Troops. If he is being transferred by packet or overland passage, it will be *posted immediately the case leaves the Command* to the Officer i/c Records, Royal Air Force, and, if by R.N. vessel, handed to the S.M.O. of the ship.

2. *Notification.*—The officer commanding the hospital will notify the airman's unit and headquarters of the air force command, of the date of transfer of the airman.

3. *Mental patients.*—In cases of mental disease a patient will in no circumstances be transferred to the United Kingdom before the next-of-kin has been informed by his unit (*see* K.R. & A.C.I., paras. 1611, clause 4 and 2316, clause 3).

4. *Families.*—When a member of the family of an airman in receipt of family allowance is transferred to the United Kingdom on medical grounds and requires further hospital treatment, the following information will be sent by signal to Air Ministry as soon as the patient embarks :—

Name of patient, name of ship, port of disembarkation, date of arrival, and whether fit to travel by train or requiring an ambulance (*see* A.M.O. A.44/35).

A.—OFFICERS, PUPIL PILOTS AND AIRMAN PILOTS OF THE REGULAR AIR FORCE.

63. Procedure.—1. The detailed procedure governing the conduct of boards on officers is laid down in K.R. & A.C.I., paras. 1430 to 1440 and 1443 to 1445.

64. Medical Boards on Officers, Pupil Pilots or Airman Pilots in Royal Naval and Military Hospitals.—1. *Attendance of R.A.F. Medical Officer.*—When an officer, pupil pilot or airman pilot of the Royal Air Force is brought before a medical board, a Royal Air Force medical officer should, where possible, serve as a member of the board (para. 85, clause 2) and the proceedings will be submitted to the competent medical authority of the appropriate R.A.F. command for his approval and disposal.

2. *Proceedings Confidential.*—As any preparatory statement by a medical officer in charge of a case and the proceedings of disability medical boards are strictly confidential, care should

be taken to ensure that no information is disclosed to the person boarded other than that provided for on the medical board summary (Form 657). (See para. 285 and K.R. & A.C.I., para. 1451.)

3. *Invaliding.*—When invaliding from the Service is contemplated, R.A.F. officers, pupil pilots and airman pilots will, where possible, be transferred to a R.A.F. hospital.

4. *Airmen undergoing "ab initio" training at civil flying training schools.*—Medical boards will not give instructions to personnel undergoing "ab initio" training at civil flying training schools without first communicating by telephone with P.M.O. Reserve Command.

5. *The competent medical authority* will take such administrative action as is necessary to ensure that the personnel staff of the R.A.F. headquarters and the individual unit are informed of the recommendations of the board.

65. Statement of Case.—Form 42 will be completed as required by para. 257, and should embody a report of the progress of the case on the reverse of the form, when necessary, for the information of the board.

66. Medical Category.—1. The standards of medical fitness for officers are detailed in K.R. & A.C.I., paras. 1430 and 1431. Those for pupil pilots and airman pilots are the same as for officers of the general duties branch. The classifications and findings of boards are detailed in K.R. & A.C.I., para. 1434.

2. *Limited flying categories.*—When the category "fit for limited flying" is used, the medical board will record their opinion as to the limitations which should be imposed (see A.P. 130, Part II, Chapter 5).

3. *Individuals undergoing flying training.*—When an officer, pupil pilot, or airman undergoing preliminary flying training is suffering from a disability not the result of a flying accident, the medical board will record on the board proceedings their opinion as to whether or not he will be fit to resume such training within a period of three months.

4. *Interim categories.*—If a medical board considers that the individual will be fit for a permanent category in a few days, and that a further board will then be unnecessary, a category of e.g. "A 1 B in 14 days" may be given, but this finding must always be qualified to show the category in the interval, e.g. "A 1 B in 14 days, until then A 4 B". When sick leave is recommended in the interim, the category will read e.g. "A 1 B in 14 days, until then A t B t". The whole category as described above will be stated fully on Forms 46, 47 and 657.

5. (a) *Special categories*—"Conditionally unfit".—This term will be used to describe candidates for flying duties who are fit A1B for the time being, but who, for any reason, are regarded as liable to become unfit for such duties and who, under present standards, would be rejected by the Central Medical Establishment as "Unfit".

On receipt of Forms 58 with such findings, the Air Ministry may ask the Central Medical Establishment for particulars as to the reason for unfitness and for as close a definition as possible of the risks that will be incurred by acceptance. Such inquiries, however, will only be made regarding candidates whom the administrative authorities have reason for considering specially. Upon receipt of information from the Air Ministry that such a case has been accepted, the Central Medical Establishment will finally complete Forms 826 and 827 and dispose of them in the usual manner.

(b) *Effects of travelling immediately prior to a Medical Board*.—If the effects of all-night travelling are such as to give rise to uncertainty in assessing medical fitness, the Central Medical Establishment will apply to Air Ministry for authority to retain the individual for one night in London, so as to observe the effects of a 24 hours' rest. The Central Medical Establishment will be responsible for informing the individual's unit accordingly.

67. Re-examination by Medical Boards.—Arrangements for re-examination must be indicated by each medical board (see K.R. & A.C.I., paras. 1437 in respect of officers and 1446 in respect of airman pilots) so long as the individual is below the standard required of him and provided his disability has not reached a permanent category.

68. Medical Boards on Officers and Airman Pilots loaned to Dominion, Colonial or Foreign Governments.—1. Officers will be brought before a medical board as laid down in K.R. & A.C.I., paras. 1432, clauses 2 and 3, and 1440, clause 3 (a) (x), and airman pilots in accordance with K.R. & A.C.I., para. 1446, clause 1 (e). A detailed examination will be carried out on Forms 42 and 43 and the board proceedings recorded on Forms 46 and 47 (see paras. 257 and 258).

B.—OFFICERS AND AIRMAN PILOTS OF THE NON-REGULAR AIR FORCES

73. Medical Boards.—1. The regulations under which medical boards are held on personnel of the non-regular air forces appear in the appropriate publications (see A.P's. 938

and 968). No instructions will be given to such personnel otherwise than on Form 657, and these will be confined to the following :—

(a) To proceed to hospital (if eligible under the regulations).

(b) To await instructions.

(See para. 285.)

2. Medical boards will not give instructions to personnel undergoing "ab initio" training at civil flying schools without first communicating by telephone with P.M.O. Reserve Command.

74. Sick leave.—The grant of sick leave to an officer or airman of the Royal Air Force Reserve (including the Royal Air Force Volunteer Reserve) and the Auxiliary Air Force may be recommended by a medical board, but the officer or airman will not be so informed by the board, either verbally or on Form 657. He will be given orders to await instructions.

C.—MEMBERS OF P.M.R.A.F. NURSING SERVICE

77. The instructions governing the procedure for medical boards on officers will apply also to members of the regular P.M.R.A.F. Nursing Service.

D.—CADETS

80.—1. General.—The regulations under which medical boards are held on officers of the regular air force will apply to cadets, with certain modifications as detailed below. Form 47 will be used in recording the proceedings of the medical board, and all questions on the form will be answered in accordance with the present procedure for officers, except as stated otherwise below. When completing the paragraph "Findings of the Board", the procedure for the medical categorization of officers will be adhered to, with the exception that the letter "A" will represent "Fitness to receive instruction in flying" instead of "Fitness for air duties".

2. Permanently unfit.—If a cadet is found by a medical board to be permanently below the required standard on account of injury sustained (a) while on flying duty, (b) while being carried in aircraft under proper authority or (c) while otherwise

undergoing authorized instruction in flying duties, the board will record its opinion in answer to the following additional questions :—

- (a) To what degree is the cadet disabled at the present time ? (*see* paras. 53 and 54).
- (b) Will such degree be permanent ?
- (c) If not permanent, how long will the present degree of disability persist ?

3. *Instructions to cadets.*—On completion of the board the cadet will be instructed to return to his unit or remain in hospital, as the case may be, to await the decision of the Air Ministry as to his disposal.

4. *Forms used.*—Forms 46, 47 and 657 will be completed and dealt with under existing regulations.

E.—AIRMEN.

83. *When to be brought before a Medical Board.*—1. An airman will be brought before a medical board on the occasions laid down in K.R. & A.C.I., paras. 652, 660 to 662, and 1446, recategorization from Grade I to Grade II or vice versa, and as otherwise deemed necessary in special circumstances.

2. Instructions regarding airman pilots are contained in paras. 63 to 68 and K.R. & A.C.I., paras. 506 and 1440. (For medical categories *see* para. 66.)

3. Medical boards on airmen of the Reserve, except when called up for training or on mobilization, will only be carried out on receipt of instructions from the Air Ministry.

84. *Transfer of Patients to the United Kingdom on Medical Grounds.*—1. *Procedure.*—(a) Part 2 of Form 496 will be completed by the airman and Parts 1 and 3 by the medical officer in charge of the case.

(b) The senior medical officer of the boarding unit or O.C. of the Royal Naval or Military hospital will submit the form to the competent medical authority for his concurrence to hold the board. This will not be necessary in the case of R.A.F. hospitals.

(c) When the board is held at a Royal Naval or Military hospital a R.A.F. medical officer will, if practicable, attend as a member in accordance with para. 93.

(d) When the Form 496 is submitted by the S.M.O. of a R.A.F. Unit, the competent medical authority will issue instructions as to where the board will be held.

(e) Where necessary, hospital investigation will be carried out as at para. 88, clause 2 (b).

(f) On completion of the board the proceedings will be passed to the competent medical authority for his approval. If he approves he will notify the appropriate branch of the headquarters so that suitable arrangements may be made for the patient to be transferred to the United Kingdom. He will then sign and return the Forms 496 to the S.M.O. or O.C. hospital.

2. *Mental disease.*—In cases of mental disease a patient will in no circumstances be transferred to the United Kingdom before the next-of-kin has been informed by the unit concerned (see K.R. & A.C.I., paras. 1611, clause 4 and 2616).

3. *Disposal of Documents.*—(a) In the event of a patient being transferred by hired transport or R.N. vessel, Form 48, together with one copy of Form 496 will be despatched to the Officer Commanding Troops. If he is being transferred by packet or overland passage, it will be despatched *immediately* the patient leaves the Command to the Officer i/c Records, Royal Air Force.

(b) The second copy of Form 496 will be retained as an office record. (See para. 59 with regard to the classification of patients.)

85. Recategorization.—1. No airman will be invalidated from the Service if he is fit for the duties of his trade at home, provided that an attributable disability is not likely to be aggravated, nor a non-attributable one converted into an attributable one by such retention.

2. (a) Part 2 of Form 496 will be completed by the airman and Parts 1 and 3 by the medical officer.

(b) Any claims made by the airman will be investigated in accordance with para. 89, clause (d) (i) and (e) (ii).

(c) Forms 496, 48 and if at a sick quarters Form 39 (completed to date from Form 41) will be forwarded to the competent medical authority of the Command to which the airman's unit properly belongs, for approval to bring the airman before a medical board. This will not be necessary when the board is being held at a R.A.F. hospital.

(d) A medical board will then be convened.

(e) In all cases Form 496 will be forwarded to the competent medical authority for approval of the board proceedings and return.

(f) If the airman is found medically fit for service in his old, or some new, category he will be returned to his unit.

These airmen will be classified as "Grade II (Fit G.S.)" or "Grade II (Fit home service only)." (See A.P. 1129, Appendix V for details.)

(g) If the airman is recategorized, Form 39, will be completed in accordance with para. 256, clause 8.

(h) The new category will be inserted on Form 48.

(i) One copy of Form 496 will be forwarded to the Officer i/c Records and the other retained as an office record.

3. When an airman pilot is found to be unfit for pilot duties by the C.M.E., a note will be made in the board proceedings as to whether or not he is considered to be below Grade I standard. If this is so, he will subsequently be boarded on Form 496 under arrangements made by the competent medical authority of his command, with a view to reclassification or invaliding from the Service. (See clause 4 below).

4. Direct entry airman pilots will be regraded on Form 496 by the Central Medical Establishment.

86. Invaliding from the Service.—An airman will be invalided (see K.R. & A.C.I., paras. 652, 653 and 660, clause 2) if, on the recommendation of a medical board, approved by a competent medical authority, he is found to be either:—

1. Permanently unfit under present standards.

Note.—An airman is considered unfit under this heading when upon medical examination his condition is found to have fallen sufficiently below the required physical standard as to prevent him carrying out efficiently the duties of his trade classification in the United Kingdom; or when he is found to be suffering from a disability which, although not affecting his trade efficiency at present, is likely to become so aggravated by further service employment as to necessitate his discharge under 2 below; or,—

2. Physically unfit for any form of air force service.

87. Invaliding of Special Cases.—1. *Amputation cases.*—When a patient (other than a civilian) has had an amputation of a limb, the officer commanding the hospital will inform Air Ministry and request instructions with regard to the fitting of an artificial limb. If the hospital is not near a Ministry of Pensions limb fitting centre, instructions will be

given for the patient to be transferred to a more suitable hospital. In effecting the transfer, if the condition of the patient will not permit of his travelling by the normal methods of conveyance, R.A.F. service transport may be used. When, the stump is healed and ready for the fitting of an artificial limb, the patient will be brought before a medical board for invaliding. As a working rule, the stump will be considered healed and ready for fitting when the condition is such that the airman is ready for the first fitting of his artificial limb. (See K.R. & A.C.I., para. 1665.)

2. *Pulmonary tuberculosis cases.*—In order that an airman suffering from pulmonary tuberculosis may be afforded the earliest possible opportunity of obtaining suitable treatment, he will be invalided as soon as the diagnosis has become reasonably certain. In the presence of combined clinical and radiological evidence indicative of pulmonary tuberculosis, diagnosis will not be delayed merely because the presence of the causative organism has not been demonstrated. (See paras. 128 and 272.)

3. *Certain surgical cases other than amputation cases.*—When it is considered that an airman requires further surgical attention in hospital to complete the treatment of his invaliding disability, an application, accompanied by a full medical report, will be submitted to the Air Ministry through the usual channels for authority to postpone the invaliding board until the treatment has been carried out.

88. Invaliding Procedure at a Unit.—1. *At the unit.*—When the medical officer in charge of a unit in the United Kingdom considers that an airman serving in the unit (not being a patient in a hospital) should be brought before a medical board to ascertain his fitness to continue serving, the following procedure will be followed :—

(a) *Documents.*—He will request the C.O. of the airman's unit to apply to the Officer i/c Records for :—

(i) Any Forms 551.

(ii) If the airman was serving on 30th September, 1921, Army Forms 496, 497 relating to his medical survey at the termination of the Great War in accordance with A.M.O. 648/21.

(iii) Form 62 if the airman enlisted subsequent to 1st June, 1921.

(b) *Approval of boarding by the competent medical authority.*—Part 2 of Form 496 will be completed by the airman and Parts 1 and 3 by the medical officer, and the

form, together with Form 48 and the forms referred to in sub-clause (a) above will then be submitted by the medical officer through the C.O. of the unit to the competent medical authority of the command to which the airman's unit properly belongs, for his concurrence.

(c) *Posting*.—On approval being given, the medical officer of the unit will ask the C.O. to apply for the airman to be posted to the nearest *station* at which there is a R.A.F. hospital. He will pass all relevant forms to the C.O. of the unit, who, on receipt of posting instructions, will forward them to the boarding unit 24 hours before the airman proceeds.

2. *At the boarding unit*.—(a) The C.O. will report the airman's arrival to the senior medical officer, who will then arrange with the C.O. of the hospital for a medical board to be convened at the hospital.

(b) *Hospital investigation*.—If the medical board considers that the case requires investigation necessitating admission to hospital prior to the expression of a final opinion, arrangements will be made for such an admission. On completion of the investigation the hospital will complete the medical board proceedings. (See para. 89.)

(c) *Findings of board and disposal of airman*.—The opinion of the medical board on Form 496 will be submitted to the competent medical authority of the command to which the airman's new unit properly belongs for his approval and if he concurs that the airman is unfit for service, the boarding unit, on return of the board proceedings, will effect the airman's discharge forthwith. If the airman is time expired and due for discharge from the Service or transfer to the Reserve, this will then be effected under the appropriate heading by the boarding unit. (See K.R. & A.C.I., para. 661 as regards an airman due for transfer to the Reserve whose disability is of a transitory nature.)

89. Invaliding Procedure at a R.A.F. Hospital. 1. As soon as the C.O. of a hospital considers that an airman patient should be brought before a medical board for the purpose of being invalided, the following procedure will be followed :—

(a) *Documents*.—The hospital will notify the airman's unit that it is proposed to bring him before a medical board and, at the same time, apply for the airman's service documents, referred to in K.R. & A.C.I., para. 659, clause 2, completed as far as possible, and also to the Officer i/c Records for the documents detailed in para. 88, clause 1 (a).

(b) *Notification of impending board.*—The office administering the hospital accounts, Air Ministry (Accounts 2A) and the hospital quartermaster will be informed of the name of the airman who is to be boarded. In the case of apprentices and boys the next of kin will also be informed.

(c) *Completion of Form 496.*—On receipt of the documents referred to in clause (a) above, part 2 of Form 496 will be completed by the airman and parts 1 and 3 by the medical officer in charge of the case.

(d) (i) *Disability claimed by individual.*—When answering the question "If you are suffering from any disease etc." in part 2 of the form, airmen make statements, sometimes rather indefinite and vague, but which in all cases must be respected and fully investigated. The medical officer completing part 3 of Form 496 must, therefore, in the first instance, take steps to verify these statements, and record on the form or by attachment thereto, the results of his investigations, before he submits the case for approval. He may require the airman to amplify or be more exact in his statement but, at the same time, he must use the utmost tact and discretion so as not to magnify in the mind of the airman or suggest to him points of irrelevant importance. Special care should be taken to investigate such points as the effect on the disability of :—injury, climate, exposure, accommodation, feeding, nature of employment, supervening diseases, exposure to contacts, epidemics, etc.

(ii) *Effects of an Exposure to Chloroacetophenone (C.A.P.) during Anti-Gas Training.*—As the result of an extensive investigation it has been shown that no disability other than lachrymation is produced by chloroacetophenone (C.A.P.). The concentrations of this gas produced in fitting respirators or during training are not sufficient to cause any damage to the respiratory system even when personnel remain in such an atmosphere for prolonged periods. The eye irritation produced by the concentrations used may occasionally last about one hour, but even this is unusual.

(iii) *Epilepsy.*—When it is proposed to discharge an airman on account of epilepsy, the medical officer will certify on Form 496 that he has seen the patient in a true epileptic fit, or, if he is unable to give such a certificate but is satisfied that the airman is suffering from true epilepsy, he will record on the Form 496 the grounds on which he bases his diagnosis.

(iv) *Consultant's report.*—When a consultant reports on a patient whom it is proposed to invalid, he will state his opinion as to the percentage of disability. This will be inserted on Form 496, but should not always prejudice the findings of the board if they are of a different opinion. The degree of disability awarded will in no circumstances be communicated to the patient.

(e) *The medical board.*—(i) The C.O. of the hospital will then arrange for the airman to be examined by a medical board.

(ii) *Disability prior to enlistment.*—If it emerges from an airman's own statement or otherwise, that he had been in receipt of an award for disability before enlistment, the medical board will direct attention to the fact by means of a note on the medical board proceedings.

(iii) *Recommendation for disposal of mental patients.*—In cases of mental disease the medical board will state in the proceedings whether they recommend the patient's discharge as a dangerous or harmless person of unsound mind and whether he should be placed in a civil mental hospital or handed over to his relatives or friends; if the latter recommendation is made, a certificate accepting full responsibility for the care of the patient will be obtained from the relatives or friends before forwarding the proceedings to the competent medical authority of the command for approval (see para. 150 and K.R. & A.C.I., para. 662).

(f) (i) *Confirmation of board by competent medical authority administering the airman's unit.*—Forms 39 (completed to date from the current Form 41), 48, 496 and any other medical or service documents held, will be passed to the competent medical authority for confirmation of the board findings. If he is not satisfied with the proceedings he will take such further action as he may consider necessary.

(ii) *False statements.*—If the competent medical authority considers that there is presumptive evidence of a false answer on the attestation paper, as regards the receipt of a disability award, he will notify the appropriate accountant officer forthwith.

90. Effective Date of Discharge of Airmen invalided from the Service.—1. The effective date of discharge of :—

(a) an airman invalided from the boarding unit will be the date of leaving that unit.

(b) an airman who is a patient in hospital, will be the date of leaving the hospital, or, if retained for further treatment, the date of receipt by the hospital of the authority for his discharge.

2. These instructions do not apply to an airman serving at home who, not being a prospective invalid, becomes due for discharge or transfer to the Reserve under the terms of his service while a patient in hospital. The transfer to the Reserve or discharge from the service in such cases will be effected on the termination of the regular Air Force portion of the engagement (see also K.R. & A.C.I., paras. 648, clause 2, 660 and 661).

91. Discharge of Airmen Invalided.—If the medical board finds the airman medically unfit for service, and the finding is concurred in by the competent medical authority, the hospital will carry out the airman's discharge forthwith as follows :—

1. *Notification of Officer i/c Records.*—The Officer Commanding will notify the Officer i/c Records of the date on which discharge will take place. (See K.R. & A.C.I., para. 661, clause 6, with regard to an airman whose disability is of a transitory nature and who is due for transfer to the Reserve.)

2. *Accounts.*—The Officer administering the hospital accounts will be informed so that the invalid may be given an advance of pay (£1). The airman's unit will be informed by the hospital of the airman's discharge from the Service and should complete the airman's clearance.

3. *The hospital quartermaster* will be informed of the impending medical board. (See para. 89, clause (b).)

Should an airman not be in possession of civilian clothing it may be obtained on repayment through the Officer in charge, Clothing Stores. If the airman's discharge takes place between the 1st October and the 31st March he will receive a free issue of a civilian greatcoat, and if invalided at any other time of the year, a free issue may be made on the recommendation of the medical board.

4. *Aircraft apprentices and boy entrants invalided on account of Rheumatism.*—The next of kin will be advised as to the desirability of continuing medical supervision after discharge.

5. *Venereal Disease.*—When an airman is invalided on account of venereal disease or has recently undergone treatment for such before discharge or transfer to

the Reserve, he will be advised by the medical officer of the unit as to the necessity for further treatment, and the address of the civilian venereal disease clinic which is nearest to his intended place of residence will be furnished to him, together with Ministry of Health Form V.15. Supplies of this form will be obtained from the A.P.F.S. in the usual manner. Lists of clinics, with their addresses will be supplied to C.O.s of hospitals periodically by the Air Ministry (M.A.4).

6. *Completion and disposal of Forms.—*

<i>Form.</i>	<i>Disposal.</i>
Form 39	See para. 256, clause 8.
Form 152 (completed for invalids as indicated on the form).	One copy to the address indicated on the form. One copy to the O. i/c Records.
Form 323	One copy to the O. i/c Records.
Form 395	One copy to the O. i/c Records.
Form 400	Two copies to the O. i/c Records
Form 460 (completed for invalids suffering from Tuberculosis).	Two copies to the address indicated on the form. One copy to the O. i/c Records.
Form 496	One copy to O. i/c Records. One copy to Office Records.
Form 496A (completed for invalids suffering from Tuberculosis).	One copy enclosed in each Form 496.
Form 3456A	One copy to the Invalid.
M. of H. Form V.15 (completed for venereal disease invalids).	One copy to the Invalid.
M. of L. Form E.D.17	One copy if the airman desires Post Office Employment or registration with the National Association for Employment of Regular Sailors, Soldiers and Airmen. One copy if the airman desires registration with the Soldiers' and Sailors' Help Society, one copy if the airman intends to reside in the Irish Free State and wishes to be registered with the British Legion in that country.
M. of L. Form U.I.3.X.S. (including U.I.69.X.S.)	One copy to O. i/c Records.

7. *Notification to invalid's next of kin.*—The date and approximate time of arrival of the invalid at the nearest railway station to his home will be notified to his next of kin.

8. *Transport of invalids to their homes.*—A railway warrant will be issued to the nearest railway station to the invalid's home. If, however, the invalid is unfit to travel by train he may be moved by ambulance transport in accordance with K.R. & A.C.I., para. 3023.

9. *Conducting Party for Invalids discharged from the Service.*—A helpless discharged airman will be conducted to his destination by an unarmed conducting party provided under local arrangements (see K.R. & A.C.I., para. 660, clause 7).

10. On the day of discharge the invalid's unit will be informed of the discharge on Form 624.

92. Retention in Hospital of Airmen discharged from the Service.—1. When the condition of an airman, whose discharge as an invalid has been approved, is such that he is unfit to travel, he may, at the discretion of the C.O. of the hospital, be retained as a free patient for further treatment under the terms of K.R. & A.C.I., para. 648, clause 5.

2. Immediately before the removal of such a patient from the hospital, he will be examined by a board of medical officers for the information of whom the proceedings of the invaliding board should, where possible, be obtained. A report in duplicate on Form 686 (modified as necessary), reviewing the degree of disablement then existing will be rendered to the Air Ministry. Discretion should, however, be exercised in these cases to avoid unnecessary duplication of boards, which need not be held where it is considered that the period of retention has been so short, and the result of treatment accorded is such, as to render unlikely any alteration of the patient's degree of disablement as assessed by the invaliding board. (See para. 292.)

93. Invaliding of Airmen from the Service at Royal Naval and Military Hospitals.—1. *Procedure.*—The invaliding of an airman from a Royal Naval or Military hospital will be carried out in all respects in accordance with the procedure indicated in para. 89 except that the C.O. of the hospital will apply to the R.A.F. competent medical authority for a decision as to the holding of a medical board, will notify the proposed date and place of sitting, and request that a R.A.F. medical officer may be detailed to act as a member of the board during the consideration of the airman's case. The R.A.F. medical officer will act on the board mainly in an advisory capacity, especially

in the matter of the completion of the board forms in accordance with R. A. F. regulations, and in order that the board may be in a position to appreciate the physical standards which are observed in the R.A.F. with particular reference to special air force conditions. The detailing of a medical officer for this duty will be subject to the exigencies of the service, and competent medical authorities will co-operate with a view to ensuring the most economical arrangements and preventing unnecessary travelling. The proceedings will be submitted to the R.A.F. competent medical authority of the command to which the airman's unit properly belongs for his approval and authority for action in accordance with the recommendations of the board (*see* para. 84, clause 1).

2. *Nervous and Mental disease.*—When the C.O. of a Royal Naval or Military hospital applies to hold a medical board on a patient suffering from nervous or mental disease, all relevant documents, *e.g.* current clinical notes, and Forms 48 and 496 will be submitted to the R.A.F. competent medical authority for transmission to the Officer Commanding, Central Medical Establishment, where it will be decided whether or not the Consultant in Neurology will be detailed as the R.A.F. member of the Board.

3. The competent medical authority will take such administrative action as is necessary to ensure that the personnel staff of the R.A.F. headquarters and the airman's unit are informed of the findings of the board.

94. Medical Board Procedure in other Cases.—1. *Claims by airmen to disability awards after discharge.*—In these cases, before an award can be made, and apart from any degree of disablement found to exist as usually assessed, it is also necessary to show the degree of incapacity to earn a livelihood at the airman's normal trade or calling (*see* K.R. & A.C.I., para. 3722). Such board proceedings will be recorded on Form 496, suitably amended, and the statement by the claimant as to his own case will be completed.

Note.—*Admission to hospital for investigation.*—Where it is considered by the medical board that the airman should be admitted to a service hospital in order that his condition may be diagnosed accurately, admission for a period up to seven days may be authorised by the competent medical authority. Admission to hospital is for the purpose of observation only, and treatment may not be given.

2. *Pensioners.*—Officers and airmen who are already in receipt of temporary disability awards will be re-examined and the results recorded on Forms 847A and 686, respectively.

95. Medical Boards on other than R.A.F. Personnel.—

1. *Attached Royal Naval and Army personnel.*—Personnel attached to the Royal Air Force from the R.N., Royal Marines, or Army, holding R.A.F. commissions, will be treated in accordance with R.A.F. regulations (with regard to sick leave for R.N. and R.M. officers, see A.M.O. A.395/26).

2. *Royal Naval personnel.*—Royal Naval personnel will be treated in accordance with "Instructions for Royal Naval Hospitals and other Medical Establishments at home and abroad."

3. *British Army personnel.*—British army personnel will be treated in accordance with the "Regulations for the Medical Services of the Army".

4. *Indian Army personnel.*—Indian army personnel will be treated in accordance with the "Regulations for the Medical Services of the Army in India".

5. *Civilian officials and employees.*—When a medical board is required, Form 2 will be used.

F.—FAMILIES OF OFFICERS AND AIRMEN

105. Medical Boards.—1. *When held.*—Normally a medical board will only be held on the wife or child of an officer or airman when it is considered necessary to transfer on medical grounds the person concerned from a station abroad to the United Kingdom. Form 2, in duplicate, will be used.

2. *Procedure.*—A statement of the case will be inserted on Form 2 by the medical officer in charge of the case and the form passed to the competent medical authority for approval and authorization to hold a medical board. The board proceedings will include a statement as to whether or not the individual requires hospital treatment on arrival in the United Kingdom (see para. 60, clause 4 and A.M.O. A.44/35). The proceedings will then be passed to the competent medical authority for concurrence, after which one copy will be sent to the S.M.O. of the ship, in accordance with para. 504, when the patient is travelling by hired transport or freight ship and the other to the Air Ministry (M.A.2). When the patient is travelling by packet passage Form 2 will be sent direct to Air Ministry (M.A.2).

3. *Records of medical boards available at Air Ministry.*—Copies of medical board proceedings on families transferred to the United Kingdom are available at the Air Ministry, and if subsequently required may be obtained on application through the usual channels. (See K.R. & A.C.I., para. 953.)

SECTION III.—MEDICAL ATTENDANCE

110. Definition.—The term “medical attendance” as defined in K.R. & A.C.I. “Explanation of Terms” means the professional advice and treatment afforded to persons, eligible in accordance with air force regulations, during sickness or injury—

- (a) as out-patients at a service medical establishment ; or
- (b) in quarters or at their residence, by a medical officer nominated for duty at the station or by a civilian medical practitioner engaged for attendance on air force personnel.

Medicines and dressings will be provided, if available, from the station sick quarters or from a dispensary of the nearest service hospital. Medical attendance does not include in-patient hospital treatment.

111. Persons Eligible for and entitled to Medical Attendance.

—1. Officers, ex-apprentice cadets, and airmen suffering from disabilities attributable to conditions of service are entitled to medical attendance at public expense.

2. As a privilege, medical attendance may also be granted to the undermentioned persons whenever there is a medical officer or civil medical practitioner acting as his relief, nominated for duty at the station, or where a whole-time civilian medical practitioner is engaged for attendance on air force personnel. The medical officer or civil medical practitioner will not be called upon to visit persons allowed medical attendance as a privilege when they reside beyond the radius fixed by K.R. & A.C.I., para. 1509.

3. The following list details the authorities under which attendance is allowed :—

(a) *Airmen in receipt of disability pensions* if specially sanctioned by the Air Ministry in accordance with K.R. & A.C.I., para. 1540.

(b) *Cadets* in respect of a disability directly attributable to a flying accident on duty, in accordance with A.P. 121, Appendix 1.

(c) *Civilian officials and employees* at home and abroad, including retired, reserve, and ex-officers holding “pro-forma” commissions under A.M.O. A.302/35, in accordance with K.R. & A.C.I., paras. 1541 and 1542 and A.P. 826.

(d) *Civilian servants* of officers in accordance with K.R. & A.C.I., para. 1520.

(e) *Dominion personnel* attached to the Royal Air Force in accordance with K.R. & A.C.I., para. 1519.

(f) *Families—*

(i) The families of officers (as defined in K.R. & A.C.I., para. 1524) in accordance with K.R. & A.C.I., para. 1521.

(ii) The families of airmen on the married establishment (as defined in K.R. & A.C.I., para. 1538) in accordance with K.R. & A.C.I., para. 1532.

(iii) The families of airmen not on the married establishment (as defined in K.R. & A.C.I., para. 1538) in accordance with K.R. & A.C.I., para. 1537, clause 1.

(iv) The families of civilian officials and employees in accordance with K.R. & A.C.I., paras. 1541, 1542 and A.P. 826.

(See “Medical attendance” in the “Explanation of Terms” of K.R. & A.C.I., page xii.)

(g) *Members of P.M.R.A.F. Nursing Service* in accordance with K.R. & A.C.I., para. 1525.

(h) *Officers in receipt of disability retired pay* in accordance with K.R. & A.C.I., para. 1526.

(i) *Officers on full pay and retired officers.*—Officers on full pay and re-employed retired officers employed elsewhere than at the Air Ministry (when not excluded therefrom by the terms of their contracts), under the terms of K.R. & A.C.I., para. 1513, clause 1.

(j) *Officers on half-pay* in accordance with K.R. & A.C.I., para. 1513, clauses 2 and 3.

(k) *Pupil pilots.*

(i) *In respect of an attributable disability.*—Pupil-pilots will be entitled to medical attendance at public expense.

(ii) *In respect of a non-attributable disability.*—Pupil-pilots will have no entitlement to free medical attendance from service or civil sources; medical attendance may, however, be afforded from service sources when no extra expense is thereby incurred to public funds. (See A.M. Pamphlet 13.)

(l) *Royal Naval and Royal Marine Officers* attached to the Royal Air Force for service with the Fleet Air Arm in accordance with A.M.O. A.550/25.

112. Persons Eligible for Out-Patient Treatment.—1. *At a service medical establishment.*—(a) All persons detailed in para. 111, clause 3 above may be permitted to attend for out-patient treatment, free of charge, at the nearest service medical establishment where facilities for such exist. The regulation however only allows them medical attendance providing no expense for transport is incurred by public funds except as

detailed in paras. 113 and 114. Such treatment will be arranged in the first instance by the medical officer or civilian medical practitioner concerned.

(b) *Scale of charges.*—For the scale of charges levied against R.A.F. funds in connection with out-patient treatment afforded to R.A.F. personnel at service medical establishments other than Royal Air Force, see A.M.O. A.344/25 (see para. 334).

2. *At civil institutions.*—Where out-patient treatment is not available from service sources, arrangements may be made by the medical officer or civilian medical practitioner concerned for the following personnel to attend civil institutions for out-patient treatment at public expense :—

(a) *Serving officers.*—Officers in respect of a disability attributable to conditions of service in accordance with K.R. & A.C.I., para. 1516, and with the approval of the competent medical authority concerned.

(b) *Cadets* in respect of a disability directly attributable to a flying accident on duty. A cadet who is an ex-apprentice will retain the benefits of medical attendance in accordance with the conditions laid down for serving airmen in K.R. & A.C.I., in so far as these may be more favourable than the benefits prescribed for cadets entering the service direct from civil life (see A.P. 121).

(c) *Pupil pilots* in respect of an attributable disability only (see A.P. 13, Appendix I).

(d) *Retired officers.*—Officers in receipt of disability retired pay in accordance with K.R. & A.C.I., para. 1526, with the approval of the Air Ministry.

(e) *P.M.R.A.F. Nursing Service.*—Members of P.M.R.A.F. Nursing Service in accordance with K.R. & A.C.I., para. 1525, with the approval of the competent medical authority concerned.

(f) *Airmen.*—Serving airmen in accordance with K.R. & A.C.I., para. 1528, with the approval of the competent medical authority concerned.

(g) *Disability Pensioners.*—Airmen in receipt of disability pensions, with the authority of the Air Ministry in accordance with K.R. & A.C.I., para. 1540.

3. *Payment.*—Where arrangements for out-patient treatment for the above personnel are not made by the medical officer or civilian medical practitioner concerned, a refund of such expenses as are considered reasonable by the competent medical authority may be recommended to the Air Ministry for approval. All claims by civil institutions will be prepared on Form 666 and forwarded to the competent medical authority for transmission to the Air Ministry for payment. Except as

provided above, claims for reimbursement at public expense on account of out-patient treatment will not be entertained (*see* K.R. & A.C.I., para. 1511).

113. Entitlement to Travelling Expenses in connection with Out-Patient Treatment.—1. *Serving officers* will be allowed travelling expenses in accordance with K.R. & A.C.I., para. 3018, *i.e.* only when proceeding under orders to a hospital for special treatment or specialist advice which cannot be given from local service sources. For this purpose, an X-ray examination as an aid to diagnosis is not included under the terms "special treatment" or "specialist advice" unless the disability is attributable to conditions of service (*see* K.R. & A.C.I., para. 3018, clause 1 (b)).

2. *Officers in receipt of disability retired pay* will be allowed travelling expenses in accordance with K.R. & A.C.I., para. 1526, clause 6 (*see* K.R. & A.C.I., para. 3019).

3. *Members of P.M.R.A.F. Nursing Service* will be allowed travelling expenses in the same circumstances as officers.

4. *Serving airmen* will be allowed travelling expenses in all cases, subject to the limitation as to cost in K.R. & A.C.I., para. 3018.

5. *Ex-airmen in receipt of disability pensions* will be allowed travelling expenses in accordance with K.R. & A.C.I., para. 1540 and railway warrants will be issued on Form 417 (*see* K.R. & A.C.I., paras. 3019, 3025 and 3041).

114. Conveyance by Mechanical Transport in connection with Medical Attendance and Out-Patient Treatment.—

1. *Medical attendance.*—Mechanical transport may be used by a medical officer nominated for duty at a station and, except when it is provided otherwise under their agreements, by civilian medical practitioners engaged for attendance on air force personnel in accordance with para. 111.

2. *Out-patient treatment.*—Persons who are allowed travelling expenses under para. 113 above, and who, by reason of their disability, are unable to travel by the normal methods of conveyance, may be conveyed for out-patient treatment by mechanical transport at public expense in cases where it is practicable and economical to do so.

3. *Other treatment.*—The use of mechanical transport in connection with medical treatment other than as above will be on repayment in accordance with K.R. & A.C.I., para. 1956, clause 1(h). (*See* A.M.O. A.357/37 with regard to traffic accidents.)

115. Employment of Local Civilian Medical Practitioners and Civilian Specialists.—1. *At R.A.F. stations.*—At a station where the services of a medical officer are not available, in

cases of extreme urgency, and when a second opinion or assistance is required, a local civilian medical practitioner may be engaged in accordance with K.R. & A.C.I., para. 1546.

2. *Officers*, on leave, or on duty where service medical attendance is not available, and who are suffering from a disability attributable to conditions of service, may employ a local civilian medical practitioner in accordance with K.R. & A.C.I., para. 1516. A civilian specialist may also be employed in accordance with the same regulations. Claims for refund of expenses will be made through the usual channels to the Air Ministry.

3. *Members of P.M.R.A.F. Nursing Service* may employ civilian medical practitioners and specialists in the same circumstances as officers.

4. *Airmen on leave or pass* may employ civilian medical practitioners in accordance with K.R. & A.C.I., para. 1400, and as published in Air Ministry Orders.

5. *Civilian specialists* may be employed in accordance with K.R. & A.C.I., para. 1552.

(See K.R. & A.C.I., para. 1511.)

116. Special Instructions regarding Officers receiving Medical Attendance Privately and the Payment of Claims.—1. *Sick at home*.—On receipt of information, or of a medical certificate, stating that an officer, not on leave and living outside the radius fixed by K.R. & A.C.I., para. 1509, is sick at home, the unit medical officer will arrange, if necessary and practicable, for his admission to the nearest service hospital. If the officer desires to make his own arrangements for medical treatment, a certificate to this effect will be obtained as required by K.R. & A.C.I., para. 1516, clause 2. The headquarters of the command concerned will be notified, through the C.O. of the unit, of the arrangements made.

2. *Sick on leave*.—(a) When an officer, returning to duty on completion of ordinary leave, reports that he has been receiving medical treatment during leave, the unit medical officer will endeavour to obtain confirmation of the illness through the officer himself, without involving air force funds, when in his opinion the future fitness of the officer is likely to be affected. Action will be taken in any case to ensure that the officer is fit for the duties of his branch. (See para. 256, clause 4 and K.R. & A.C.I., para. 713.)

(b) When an officer is unable, through illness, to return to duty on completion of ordinary leave, he is required to forward a medical certificate in accordance with K.R. & A.C.I.,

para. 1384. Action will then be taken to regularize the medical position of the officer as required by K.R. & A.C.I., para. 1382, clause 1 (*d*), headquarters of the command concerned being notified through the C.O. of the unit. The unit medical officer will arrange, if necessary and practicable, for the officer to be admitted to the nearest service hospital.

3. *Claims*.—Claims for the recovery of expenses will only be submitted in accordance with K.R. & A.C.I., para. 1516.

117. Special Instructions regarding Airmen receiving Medical Attendance Privately and the Payment of Claims Incurred.—

1. *Sick at home*.—On receipt of information, or of a medical certificate, stating that an airman, not on leave or pass, is sick at home, the unit medical officer will arrange for his transfer, when fit to be moved, to station sick quarters or to the nearest service hospital or, if that is impracticable, to a civil hospital. If it is ascertained that a civilian medical practitioner is already in charge of the case, he will be consulted prior to the transfer. (*See* para. 256, clause 4.)

2. *Sick on leave or pass*.—When an airman is sick on leave or pass and has employed a civilian medical practitioner, he is required to forward a medical certificate to this effect in accordance with K.R. & A.C.I., para. 1400, clause 2. The unit medical officer will, after scrutiny of the certificate, ascertain when the airman will be fit to be moved to the nearest service hospital or fit to return to duty, and will take action accordingly. The competent medical authority concerned will be informed when action is required in accordance with K.R. & A.C.I., para. 1400, clauses 2 and 4. Any action required in accordance with A.M.Os. will be arranged through the C.O. of the unit. (*See* para. 256, clause 4.)

3. *Claims*.—Claims for payment of civilian medical practitioners are dealt with on Form 1667. This form will be forwarded as directed by K.R. & A.C.I., para. 1400, clause 3, for completion by the civilian medical practitioner concerned. Unit medical officers will assist their C.Os. in checking the amounts claimed with the mileage fees allowable in accordance with K.R. & A.C.I., para. 1550. The form will be dealt with as directed by K.R. & A.C.I., para. 1551.

4. Competent medical authorities will keep a register in which all claims of civilian medical practitioners are recorded. S.O. Book 129 is suitable for this purpose.

SECTION IV.—SICK QUARTERS ADMINISTRATION

125. Sick Quarters.—1. *Provision.*—Sick quarters or medical inspection rooms are provided at all stations to which medical personnel are posted. Medical officers are required to exercise their discretion in deciding the cases which should be retained in station sick quarters for treatment and avoid sending cases to hospital which can be effectively and efficiently treated in station sick quarters.

2. *Accommodation and Scale of Beds.*—(a) The accommodation in a station sick quarters provides not only facilities for the rendering of first aid in accidents and for the daily medical routine work, including sick parades, minor surgery and medical examinations and inspections, but also a number of beds for the following :—

(i) Cases of sickness or injury which should ordinarily not require hospital treatment but should be fit to return to duty after some days of appropriate treatment and diet as can be provided.

(ii) Cases discharged from hospital requiring a continuation of treatment as convalescent patient.

(iii) Serious emergency cases, where a major operation may be required as part of the first aid treatment. It is left to the discretion of the medical officer to decide whether such treatment can best be given in sick quarters or after removal to hospital. (For cases not to be retained see para. 129.)

(b) As a general rule, beds are provided on a scale of 1 per cent. of the total establishment of the station, with a minimum of four beds for any one station.

3. *Administration of general anaesthetics.*—(See para. 213.)

4. *Consultants.*—(a) Medical officers of R.A.F. stations who wish to send cases for opinion to a consultant's normal unit, or to one of the other units which he visits regularly, may do so without reference to higher authority, but they should confirm beforehand with the C.O. of the medical unit concerned that the consultant proposes to visit the unit according to programme.

(b) In circumstances where a medical officer of a unit other than a hospital considers a consultation is necessary, but the patient is unfit to travel, the medical officer may make application to the principal medical officer of the command for a consultant to visit the case. The principal medical officer will, if he concurs, make the necessary arrangements direct with the C.O. of the Central Medical Establishment.

(c) When consultants are required to visit hospitals on other than routine visits, C.Os. will make application direct to the C.O., Central Medical Establishment. On occasions when the Central Medical Establishment is closed, they will communicate direct with the appropriate consultant, confirming the application later by letter to the C.O., Central Medical Establishment.

5. *Disciplinary Powers.*—The C.O. of a station may delegate disciplinary powers to medical officers posted for duty at that station in accordance with K.R. & A.C.I., para. 1141; these powers of punishment, however, will extend to sick quarters staff only and not to patients. On arrival at a station, a medical officer will ascertain, therefore, whether or not these powers have been delegated to him. (See K.R. & A.C.I., paras. 1477–1499.)

6. *Doping Rooms.*—Airmen employed in doping rooms will be examined quarterly, a record of the examinations being kept at the sick quarters. (See para. 606.)

7. *Employment of patients on light duties.*—Convalescent patients may be employed on light duties in accordance with para. 208.

8. *Equipment and equipment accounts.*—The Medical Officer in charge will be responsible for the medical equipment and the accounts thereof as laid down in Chapter IV.

9. *Families of airmen, admission to hospital.*—When a member of an airman's family is admitted to hospital, the C.O. of the airman's unit will be notified in order that the necessary entries may be made in the unit casualty forms.

10. *Filing and office routine.* (See A.P. 947.)

11. *Medical Comforts.*—A Medical Comforts Register will be maintained showing the receipt and issue of all comforts and also the names of the patients receiving the comforts. The quantities will be totalled at the end of each month and a check of stock made. (See A.P. 112, Chapter XX, para. 12 and K.R. & A.C.I., paras. 2670, 2671 and 2674. With regard to comforts for families see A.P. 112, Chapter XX, para. 11, clause (ii).)

12. *N.C.O. patients to wear chevrons.*—Chevrons will be worn by N.C.Os. as detailed in para. 207.

13. *Record of Sick Parades and Medical Inspections* (see para. 340).—(a) S.O. Book 122 will normally be used.

(b) All entries will be written legibly. Separate books will be kept for (i) officers and civilian officials of the officer grade, (ii) airmen (including naval ratings, soldiers and civilian employees), (iii) families, (iv) W.A.A.F. officers and aircraft women.

(c) The date will be written at the top of the page or, in order to save space, conveniently on the page after the last entry of the previous day.

(d) The following details will then be entered :—

(i) The number, rank and name of the person examined ; briefly of what he complains and history (in the case of an injury how it occurred or is *stated* to have occurred, and whether on or off duty or in organised games); briefly what is found on examination (the part affected must be definitely and clearly designated so as to leave no doubt in any subsequent enquiry) ; the diagnosis ; the treatment prescribed ; the disposal of the case.

(ii) If the patient has been seen before and is continuing treatment the following entries only need appear :—the number, rank and name with the diagnosis ; progress since last seen and page of book on which previous entry appears ; treatment prescribed and disposal.

(iii) When the case is admitted to sick quarters for over 48 hours, or is sent to hospital, or when a Form 41 is prepared for any other reason, it will be unnecessary to complete details other than number, rank and name with diagnosis and disposal, as the details of symptoms and treatment will be available subsequently on Form 41.

(iv) If the patient attends immediately after discharge from sick quarters or hospital he will be dealt with as in (ii).

(v) On each occasion when sick are seen by the medical officer he will sign the book immediately below the last entry.

(e) The alphabetical index at the end of the book may be used optionally for easy reference, the name of the patient being inserted under the appropriate letter with the number of the page on which the name appears and any subsequent numbers.

14. *Seriously ill and Dangerously ill patients and Deaths* will be reported immediately to the C.O. of the station and to the competent medical officer of the command.

15. *Sick leave.* (See para. 176.)

16. *Standing Orders for Sick Quarters personnel.*—Standing orders will be drawn up by the medical officer for all personnel under his command. Each member of the staff will sign a statement to the effect that he has read and understood the orders applicable to his duties.

17. *Statistics.*—The medical officer in charge will exercise every care to ensure that sick quarters medical statistics are accurately prepared. The writing will be clear and legible,

and all names and medical terms will be written in block capitals to facilitate the typing of cards and flimsies. In view, however, of the confidential nature of medical documents, he will, if he considers it specially necessary, complete the cards and flimsies himself in manuscript.

18. *Treatment of Warrant Officers.*—Warrant officers will, in ordinary circumstances, receive medical attendance in their own quarters, but will, when it is considered necessary by the medical officer, be admitted to sick quarters, separate accommodation being afforded them when practicable. When under treatment in quarters they may, if considered desirable, receive diets and extras as laid down in K.R. & A.C.I., para. 2674.

19. *Ward Orderlies' Report Book.*—Whenever an orderly in charge of a ward comes off duty, he will write a report which will include anything with regard to individual patients which he considers should be brought to the notice of the medical officer. S.O. Book 129 (not indexed) is suitable for this purpose.

20. *Ward Treatment Books.*—A book will be maintained in each ward in which will be written the treatment prescribed for each patient. S.O. Book 129 (not indexed) is suitable for this purpose.

21. *Change of medical officer.*—(a) Whenever the officer in medical charge of a station is changed, the incoming officer will make a thorough inspection of the medical records and will give a receipt for them to his predecessor, a copy of which will be transmitted to the competent medical authority. A certificate will be added to the receipt stating that the records are complete and in proper order, or, if they are deficient, giving details of the deficiencies.

(b) The incoming medical officer will also take stock of all medical and barrack equipment and report any discrepancies found between actual stock and the accounts (*see* para. 389, clause 2).

22. *Stations without medical officers.*—Where there is no R.A.F. medical officer at the station, the C.O. will be responsible for rendering Forms 38 and 39 (*see* K.R. & A.C.I., para. 1495).

23. *Closing of station.*—(a) Whenever a station is closed, the sick quarters medical records will be forwarded to the competent medical authority, who, after scrutiny, will transmit them to the Air Ministry.

(b) Instructions with regard to the disposal of medical equipment will be given by the competent medical authority.

(c) Barrack equipment will be returned to the unit equipment stores.

126. Ambulances.—1. The medical officer will be responsible for all movements (except those in connection with maintenance, and as provided in K.R. & A.C.I., para. 823) of motor ambulances. His written authority will be required for the use of motor ambulances; such authority will only be given for the conveyance of the sick or injured, of medical equipment, or for other medical purposes.

For this purpose a complete record of all journeys will be kept in S.O. Book 136 (not indexed) which he will sign daily.

(a) He will represent the matter to the C.O. if he considers a driver detailed for ambulance work to be unsuitable.

(b) If an ambulance is not available in a medical emergency, he will have prior claim on the transport of the station.

(c) He may allow an airman's family (as defined in K.R. & A.C.I., para. 1538) to be conveyed in an ambulance to (but not from) hospital (when such conveyance is not provided by the civilian authorities) when suffering from an infectious disease and it is considered necessary for the safety of the air force personnel that they should be removed to hospital.

(d) He may permit the use of service ambulances for the free conveyance to (but not from) hospitals of families of airmen on the married establishment in serious and urgent cases, where the admission is authorised under the conditions laid down in para. 312 and K.R. & A.C.I., para. 1534, and where the special medical features of the case demand it, within the conditions laid down in K.R. & A.C.I., para. 1536.

(e) See para. 127 and K.R. & A.C.I., paras. 1484 and 1956 (1) (h).

2. Responsibility of reporting accidents and despatching ambulances.—(a) Flying accidents will normally be reported to the medical officer by the duty pilot, on whom also devolves the responsibility of despatching the ambulance to the scene of the accident. (See K.R. & A.C.I., para. 823, clause 5 (p).)

(b) All injuries will be reported by the medical officer to the C.O. of the station in order that action in accordance with K.R. & A.C.I., paras. 2312 and 2313 may be taken.

3. Civilian Officials and Employees.—If an Air Ministry employee sustains injury or becomes suddenly ill while on duty, first-aid treatment may be given as indicated in A.P. 826. He may also be conveyed by service transport, without charge, to hospital or to his home, provided he is unable to proceed by other means and the necessity is certified by a medical officer, civil medical practitioner, or the C.O.

4. *Civilians*.—Civilians not connected with the Royal Air Force may be admitted to a R.A.F. hospital or sick quarters only on account of injuries sustained in the vicinity of an air force station and when civil facilities are not available. Conveyance of civilians by service transport either to a R.A.F. or civil hospital will be on repayment. The Air Ministry will be informed as soon as possible, through the competent medical authority, of all such admissions with full particulars of each case (see K.R. & A.C.I., para. 1512).

127. First Aid.—1. *Precautions during flying*.—(a) The regulations with regard to the precautions to be taken for the conveyance of injured persons are contained in para. 130 and in K.R. & A.C.I., para. 714, those governing the responsibility for the removal of such injured persons being contained in K.R. & A.C.I., para. 1879, clause 5. When flying is in progress and the R.A.F. medical officer is prevented from being in attendance, the C.O. will arrange that the services of the "regular medical practitioner" or other civilian medical practitioner are available in accordance with K.R. & A.C.I., para. 1499.

(b) *Civil aircraft*.—In cases of injury to the personnel of a civil aircraft involved in an accident in the vicinity of the R.A.F. Station the medical officer will render first aid as laid down in K.R. & A.C.I., para. 2044.

128. Personnel under Observation for Pulmonary Tuberculosis.—1. *Period of observation*.—On discharge from hospital, serving personnel under observation for pulmonary tuberculosis will be kept under observation by the medical officer of the unit, and general and sputum examinations will be carried out by him each month until it can be assumed that the grounds for this no longer exist (see para. 275).

2. *Record book*.—Record of the monthly examinations will be kept in a special book.

3. *Certificate after final examination*.—When the monthly examinations are discontinued, a certificate to that effect will be forwarded to the Air Ministry through the usual channels. This certificate will state the enclosure number in Form 48 of the relative Form 39 (see para. 256, clause 13 (f)), and an entry will be made on the flimsy copy in red ink that the certificate has been sent.

4. *Posting during period of observation*.—Should the officer or airman be posted to another unit while still under observation, a notification stating "under observation, A.P. 1269, para. 128" will be attached to the outside of his Form 48 and sent to his new unit with his other documents.

129. Airmen for Admission to Hospital.—1. *Patients admitted.*

—Every patient requiring hospital treatment will be sent to a hospital if and when he is fit to travel. The following types of cases will be transferred to hospital :—

(a) Cases which for their diagnosis, operative or other treatment, or after-treatment, require special skilled assistance or equipment which is not available in sick quarters nor procurable in sufficient time from service sources.

(b) Venereal cases.

(c) Patients under observation for mental disease.

2. *Procedure.*—Before sending a case from an outstation for admission to hospital, the medical officer will ascertain from the C.O. of the hospital, or his deputy, that suitable accommodation is available for the particular type of case. If accommodation is available, he will state the time and date the patient is expected to arrive at the hospital.

3. *Effects to be taken.*—Instructions as to the effects to be sent with an airman proceeding to hospital are given in K.R. & A.C.I., para. 2600, clause 1.

4. *Rations not to be sent.*—Rations will not be sent with an airman proceeding to hospital (see K.R. & A.C.I., para. 2673, clause 2).

130. Cases to be Accompanied by Medical Officer to Hospital.

—All serious cases will be accompanied by a medical officer to hospital when practicable. When one medical officer only is borne for duty at the station and flying is in progress, he will not accompany a case to hospital without the sanction of the C.O. of the station. Where a patient's life is in danger, the medical officer will take care to represent the gravity of the case to the C.O. (see para. 127 and K.R. & A.C.I., para. 1484).

131. Transport of Casualties by Air.—1. *Neil-Robertson stretcher.*—In small aircraft, patients unable to travel as sitting cases can be carried by Neil-Robertson stretcher.

2. *Universal stretcher sheet.*—In larger aircraft, patients can be carried on the general service stretcher. Where difficulty is found in inserting a loaded stretcher through a narrow door of an aircraft without placing the stretcher on its side, the Universal Stretcher Sheet can be used as an attachment.

Note.—With both the Neil-Robertson stretcher and the Universal Stretcher Sheet, a patient can be carried in any position even though a Thomas' splint is applied. Full instructions are included with each type of apparatus as issued by the equipment branch.

132. Laundry and Repair Arrangements.—The medical officer will make arrangements direct with the equipment officer of the station. Form 25 will be used. (*See A.P. 830, Vol. I, Chapter 26, para. 6 et seq.*)

133. Custody of Dental Equipment.—1. *Whole time dental officer.*—Dental equipment at stations will be in the charge of the dental officer, who will be responsible for its safe custody, the maintenance of a sufficient stock of expendable articles, and for the keeping of the prescribed accounts (*see Chapter IV*).

2. *Visiting dental officer.*—When there is no dental officer posted to a station the dental work will be carried out by a visiting dental officer and that officer will be responsible for the dental equipment on charge at the station. In such cases adequate lock-up accommodation for the dental equipment will be provided.

3. *Loan of equipment to the medical officer in charge.*—The dental officer will issue on loan to the medical officer extraction forceps and other equipment necessary for use in his absence. He will obtain a receipt from the medical officer who will be personally responsible for the articles.

134. Dental Treatment by Civil Dental Surgeons.—1. Where a service dental officer or whole-time civilian dental surgeon is not available, the medical officer of a station may refer an officer or airman entitled to dental treatment in accordance with K.R. & A.C.I., paras. 1564 and 1566 to a civilian dental surgeon who agrees to undertake urgent dental treatment on a fee basis, and with whom arrangements have been made for emergency work on R.A.F. personnel (but *see* clause 2 below). The medical officer may give authority for immediate treatment (but not denture work) at the first visit up to a maximum of 10s. 6d. (*see* K.R. & A.C.I., para. 1571, clause 2 (d)). If the total estimate of treatment required does not exceed £1, the approval of the inspecting dental officer at home, or the competent medical authority abroad is not required. No denture work of any description will be sanctioned without the prior approval of the inspecting dental officer at home or competent medical authority abroad.

2. Officers, other than those of the general duties branch as specified in K.R. & A.C.I., para. 1564, clause 2 (b), are not entitled to treatment by a civilian dental surgeon employed on a fee basis except those specified at clause 2 (a) of the same paragraph (*see* para. 284).

3. Members of P.M.R.A.F. Nursing Service will be allowed treatment on the same conditions as for officers.

135. Lectures.—1. *Medical personnel.*—The medical officer will be responsible that lectures on the subjects of examination as set forth in A.P. 1112 are delivered to such medical airmen as are preparing themselves for the various trade tests (see para. 335 with regard to returns and also K.R. & A.C.I., Chapter IX, Section II).

2. *Non-medical personnel.*—The medical officer in charge will be responsible that lectures are delivered from time to time to officers and airmen on the principles and importance of sanitary measures, on the subject of venereal disease and personal hygiene, elementary first-aid (including the use of the tubunic ampoule) and first field dressings.

3. *A register of all lectures given* will be maintained at the sick quarters.

SECTION V.—TREATMENT IN HOSPITALS AND INSTITUTIONS

A.—SERVICE HOSPITALS

146. Officers and Cadets.—Hospital treatment may be afforded in the following circumstances :—

1. *Officers on full pay, half-pay, and retired officers re-employed,* in accordance with K.R. & A.C.I., para. 1514.

2. *Retired officers,* in accordance with K.R. & A.C.I., para. 1526 (see also A.M.O. A.134/36).

3. *Royal Naval and Royal Marine Officers* attached to the Royal Air Force for service with the Fleet Air Arm, in accordance with A.M.O. A.550/25. Hospital charges are not levied.

4. *Officers of the Dominions permanent forces,* in accordance with K.R. & A.C.I., para. 1519.

5. *Retired, Reserve and ex-officers serving in civilian posts* in accordance with A.M.O. A.134/36.

6. *Cadets* while at the R.A.F. College may be admitted to the R.A.F. Hospital at Cranwell, charges being levied in accordance with A.P. 121, Appendix I, clause 4.

147. Pupil Pilots.—Pupil pilots may be afforded hospital treatment in accordance with the conditions detailed for medical attendance in para. 111, clause 3 (k) (see A.M. Pamphlet 13, Appendix I).

148. Members of Princess Mary's R.A.F. Nursing Service.—Hospital treatment will be afforded as in the case of officers on full pay, but hospital charges will not be levied otherwise than as provided in A.P. 1075 (see K.R. & A.C.I., para. 1525).

149. Airmen.—Airmen will be afforded hospital treatment as necessary ; hospital charges will only be levied in cases due to the airman's own fault, and offences under the Air Force Act, in accordance with K.R. & A.C.I., para. 1545. " Relapses " of venereal disease will (in contradistinction to " sequelae ") be regarded as coming under the term " due to the airman's own fault ", and hospital charges will be levied accordingly. Cases which have not remained clinically free from the direct and usual results of the original infection will be regarded as relapses, whereas those in which the condition has but a constitutionally remote connection with the original infection will be regarded as " sequelae " and will not be liable for charges in accordance with K.R. & A.C.I., para. 1545.

150. Cases of Mental Disease.—1. *Notification of unit.*—

(a) When an officer or airman is under observation for mental disease and the competent medical authority is of the opinion that the relatives should be informed, the hospital will notify the unit accordingly by letter.

(b) When an officer or airman is certified to be of unsound mind, or is about to be invalided for mental disease, a report will be sent to the unit concerned in order that the next of kin may be informed.

2. *Observation mental cases (Psychoses).*—(a) As far as practicable, cases will be admitted to hospital at Halton for preliminary observation. Those who are then found to be showing signs of a psychosis will be transferred to " D " Block, The Royal Victoria Hospital, Netley, or other suitable accommodation in a service hospital.

(b) Where doubt or difficulty arises in connection with an acute case developing at a station, the medical officer will at once notify the competent medical authority, who will, if necessary, consult the Consultant in Neurology as to the action to be taken.

(c) If required, the Consultant in Neurology will visit the station to see the patient and arrange for his disposal.

3. *Nervous cases (Psychoneurosis or Organic).*—(a) Cases of organic or functional nervous disease, including epilepsy, will, as far as practicable, be admitted to Princess Mary's Royal Air Force Hospital, Halton, unless unfit to travel, in which case they must be admitted to the nearest suitable service hospital.

(b) Officer patients diagnosed as Mental, N.Y.D. Mental, or Neurasthenia, will not be sent to the R.A.F. Officers' Hospital, Uxbridge, but will be dealt with as laid down in clause 2 (a) and (b).

4. *Admission to the Royal Victoria Hospital, Netley.*—When an airman of unsound mind is sent to " D " Block, The Royal

Victoria Hospital, Netley, Forms 39 and 833 will be completed. The flimsy Form 39 and duplicate Form 833 will be forwarded in Form 48 to Netley Hospital not less than two clear days before the despatch of the airman to the hospital.

5. *Admission to an Institution.*—(a) *General.*—An airman of unsound mind serving in the United Kingdom will not be removed to a civil mental hospital or other institution without the sanction of the air or other officer commanding. When such authority has been given for temporary treatment, the procedure indicated in clauses (b) (c) and (d) will be followed, all necessary instructions being issued by the air or other officer commanding. Form 262 will accompany the patient in each case.

(b) *England and Wales.*—If the airman is serving in England or Wales, an order for his reception must be obtained (in pursuance of Section 4, Lunacy Act, 1890) from a justice of the peace, on a petition supported by two medical certificates. Unless immediate operation of this order has been legally suspended, it must be carried into effect within seven days.

(c) *Scotland.*—If the airman is serving in Scotland, a sheriff's order in accordance with Section 4, Lunacy (Scotland) Act, 1862, must be procured after the consent of the authorities of the institution concerned to receive the airman has been obtained. Unless the immediate operation of this order has been legally suspended, it must be carried into effect within fourteen days.

(d) *Northern Ireland.*—If the airman is serving in Northern Ireland, application will be made to the resident medical superintendent of the district mental hospital assigned to the city, town or county in which the airman is stationed, to ascertain the date and hour at which the airman can be received there; the airman may thereafter be removed to such hospital under the instructions of the air or other officer commanding.

6. *Charges to be made against an airman in respect of temporary maintenance in a civil institution.*—The cost of maintenance of an airman temporarily under treatment in a civil mental hospital will be adjusted in accordance with K.R. & A.C.I., paras. 1539 and 1545. (For regulations regarding mechanical restraints see para. 214.)

151. **Disability Pensioners.**—Subject to certain approved conditions, airmen granted pensions in consequence of disabilities directly attributable to post-war service may be afforded hospital treatment for the disability on account of which they were discharged. Application by or on behalf of pensioners for treatment will be addressed to the Under Secretary of State, Air Ministry (see K.R. & A.C.I., para. 1540).

152. Airmen's Families.—1. *Families of airmen on the married establishment.*—These may be admitted to a service families' hospital, except in cases of chronic illness (unless for the purpose of operation or relief of acute condition) and infectious disease (other than as referred to in clause 3 below) on the authority of the competent medical authority, in accordance with K.R. & A.C.I., para. 1533, clauses 2 and 3. Where admissions to hospital are authorized in accordance with regulations, hospital charges will only be levied in confinement cases (*see* K.R. & A.C.I., para. 1545).

2. *Families of airmen not on the married establishment.*—

(a) *Infectious diseases.*—These may be admitted to a service families' hospital, in accordance with K.R. & A.C.I., para. 1537, clause 2, where such a course is considered necessary by the competent medical authority to prevent the spread of infectious disease among R.A.F. personnel. In such circumstances no hospital charges will be made.

(b) *Special circumstances.*—They may also be admitted in other special circumstances on the authority of the air or other officer commanding and in accordance with K.R. & A.C.I., para. 1537, clause 3.

(c) *Confinement cases.*—Cases of confinement will not be admitted unless the aspect of the case justifies exceptional treatment. Hospital charges will be levied as detailed in K.R. & A.C.I., para. 1545.

Note.—Forms 1511 will be prepared to cover the admission of all families to hospital (*see* para. 312).

3. *Infectious disease.*—(a) *At a R.A.F. station.*—When an infectious disease, scheduled in K.R. & A.C.I., para. 1533, clause 1, arises in an airman's family resident within the precincts of a R.A.F. station, the patient will invariably be admitted to hospital.

(b) *Outside a R.A.F. station.*—Cases of infectious disease occurring among families of airmen not so resident and under the control, therefore, of the local sanitary authority, will be considered by that authority in the first instance, and, if admitted to hospital for the safety of the general community, no liability to R.A.F. funds will be accepted.

(c) *Cases not admitted by a civil authority.*—Where, however, admission to hospital is not considered necessary in the interest of public health, the case will be considered by the competent medical authority of the R.A.F. command from the point of view of the safety of R.A.F. personnel generally, and admitted to hospital, if necessary, on the authority of the air or other officer commanding. (For admissions to civil hospitals *see* para. 164.)

153. Civilian Officials and Employees.—1. *In the United Kingdom.*—(a) Those who have been offered and have accepted the government scheme of compensation may be admitted, when necessary, to a service hospital in cases of disability resulting from an injury arising out of and during the course of their employment, or of an industrial disease scheduled in accordance with Workmen's Compensation Act or due to the nature of their employment. Hospital charges will be applied as directed in A.P. 826.

(b) Civilian officials, employees and their families resident in official quarters on R.A.F. stations, if suffering from infectious or mental disease, may be admitted to a service hospital when no civil facilities exist, for the safety of R.A.F. personnel, or on urgent medical grounds only; if admitted on urgent medical grounds, hospital charges will be applied as directed in A.P. 826.

2. *Abroad.*—In accordance with K.R. & A.C.I., para. 1541, civilian officials, civilian employees, and the families of civilian employees may be admitted to a service hospital in case of emergency, infectious disease (if the medical officer considers it essential for the safety of service personnel) and also in accordance with the government scheme of compensation if no suitable civil hospital is available (*see* A.P. 826, paras. 180 to 183). The charges detailed in K.R. & A.C.I., para. 1541, will be levied where applicable. (*See* K.R. & A.C.I., paras. 1542 and 1543.)

154. Officers' Civilian Servants and Civilians not Employed by the Air Ministry.—Individuals under this heading contracting infectious disease may be admitted to hospital in accordance with K.R. & A.C.I., para. 1543. Non-infectious cases may be admitted in accordance with K.R. & A.C.I., para. 1542, clause 2, the Air Ministry being informed as soon as possible through the usual channels, of such admissions.

B.—CIVIL HOSPITALS

160. Admission to Civil Hospitals and Charges Levied.—If the facilities of a service hospital are not available, admission to a civil hospital of the personnel as detailed in paras. 161 to 165 may be allowed, and hospital charges will be levied where applicable as in service hospitals. (*See* K.R. & A.C.I., para. 1512.)

161. Officers and Pupil Pilots.—1. *Officers on full pay and half-pay, and retired officers re-employed,* may be admitted to civil hospitals in accordance with K.R. & A.C.I., para. 1515.

2. *Retired officers* may be admitted in accordance with K.R. & A.C.I., para. 1526.

3. *Royal Naval and Royal Marine officers* attached to the Royal Air Force for service with the Fleet Air Arm may be admitted in accordance with A.M.O. A.550/25.

4. *Cadets* may be admitted in accordance with K.R. & A.C.I., para. 1515. Hospital treatment for attributable flying accidents only will be borne by public funds. (See A.P. 121, Appendix I, para. 4 (iv).)

5. *Pupil pilots* may be admitted to civil hospitals in accordance with A.M. Pamphlet 13, Appendix I.

162. Members of P.M.R.A.F. Nursing Service.—Members of P.M.R.A.F. Nursing Service may be admitted to civil hospitals in the same circumstances as officers and in accordance with K.R. & A.C.I., para. 1525.

163. Airmen.—Airmen may be admitted to civil hospitals when necessary in accordance with K.R. & A.C.I., para. 1531.

164. Airmen's Families.—1. *At a R.A.F. Station.*—Airmen's families may be admitted to civil hospitals if resident within the precincts of a R.A.F. station and suffering from infectious disease as scheduled in K.R. & A.C.I., para. 1533, clause 1.

2. *Outside a R.A.F. Station.*—If not so resident, and admission to hospital is not considered necessary by the local health authority in the interests of the general community, cases of infectious disease may be admitted to civil hospitals when it is considered by the competent medical authority that this course is necessary to prevent the spread of infectious disease among R.A.F. personnel.

3. *Special circumstances.*—In certain circumstances, where the urgency or other special features of the case demand it, families on the married establishment may be admitted to civil hospitals in accordance with K.R. & A.C.I., para. 1534, but only by the station medical officer or a civil medical practitioner acting in an official capacity in the absence of the station medical officer. (For admission to service hospitals see para. 152.)

165. Civilian Officials, Employees and their Families Abroad.—These may be admitted to civil hospitals in accordance with K.R. & A.C.I., para. 1541.

166. Detail Instructions regarding Admission to Civil Hospitals and the Payment of Claims.—1. *Entitlement**.—The entitlement of admission to a civil hospital is laid down in paras. 161 to 165 and in K.R. & A.C.I., Chapter XIX, Section IV. Unit medical officers will ensure that cases admitted under their directions are eligible for treatment at public expense, otherwise financial hardships may be caused. Attention is directed to the fact that chronic cases will not be

* See also A.M.O. A.507/39.

considered as eligible for admission to a civil hospital in accordance with this paragraph, and that no liability for the cost of hospital treatment in such cases will be accepted by the Air Ministry.

2. *Approval of admission*.*—On admission, Form 3467 will be forwarded to the competent medical authority of the command on whose strength the individual is borne, requesting approval for the action taken. The competent medical authority will advise the air or other officer commanding as to the necessity for the admission. The air or other officer commanding may approve the admission of officers and members of P.M.R.A.F. Nursing Service, whose disabilities are regarded as directly attributable to conditions of service, and will inform the Air Ministry immediately, giving full details of each case. Approval will also be given for the admission of airmen, but it will be unnecessary to inform the Air Ministry. In the case of wives and families of airmen, the air or other officer commanding will obtain Air Ministry sanction for all such admissions prior to approving the admission, but may give provisional approval in urgent circumstances.

3. *Cases admitted by civil medical practitioners.*—When the wife or child of an airman is admitted to a civil hospital by a civil medical practitioner, on account of an acute condition, the hospital charges will not be borne by the Air Ministry unless the practitioner is under whole time contract with the Air Ministry or acting in an official capacity in the absence of the station medical officer.

4. *Transfer of cases to service hospitals.*—The unit medical officer will keep in close touch with the civil hospital authorities and should arrange for the transfer of the case to the nearest service hospital as early as practicable. Normally the transfer should be carried out by rail, but service transport may be utilized when there are special medical grounds or when the distance is not considered excessive and transfer by such a method will result in a saving to air force funds.

5. *Patients in hospital over three months.*—(See para. 321.)

6. *Patients transferred or discharged.*—When the case is transferred or discharged, the unit medical officer will obtain from the civil hospital authorities the full amount of the claim for all services rendered. Form 3467 will then be completed, the hospital account attached, and forwarded to the competent medical authority for counter-signature and transmission to the Air Ministry for payment in accordance with K.R. & A.C.I., para. 1515, clause 4.

* See also A.M.O. A.504/39.

7. *A register of all hospital claims* will be kept by competent medical authorities. S.O. Book 129 is suitable for this purpose.

C.—TRAVELLING EXPENSES

167. Entitlement to Travelling Expenses in connection with In-patient Hospital Treatment.—1. The following will be allowed travelling expenses :—

(a) Officers, airmen and members of P.M.R.A.F. Nursing Service, serving in the regular air force, in accordance with K.R. & A.C.I., paras. 3018 and 3019.

(b) Officers and members of the P.M.R.A.F. Nursing Service in receipt of disability retired pay, in accordance with K.R. & A.C.I., paras. 1526, clause 6 and 3019.

(c) Cadets, for attributable flying accidents.

(d) Airmen in receipt of a disability pension, in accordance with K.R. & A.C.I., paras. 1540, 3019 and 3025.

Note.—With regard to admission to King Edward VII Hospital (Sister Agnes, Founder) and King Edward VII Convalescent Home, Osborne, *see* K.R. & A.C.I., para. 3018, clause 1 (a).

2. Other persons (including families), who may be admitted to hospital, will not be allowed travelling expenses unless specially authorised by the Air Ministry.

168. Conveyance by Service Transport in connection with In-patient Hospital Treatment.—1. The following may be allowed conveyance by service transport :—

(a) Persons who are allowed travelling expenses in accordance with para. 167 above, and who, by reason of their disability, are unable to travel by the normal methods of conveyance, may be conveyed to hospital (but not from hospital on discharge) or transferred to another hospital by service transport at public expense in cases where it is practicable and economical to do so.

(b) The families or airmen (as defined in K.R. & A.C.I., para. 1538) may be conveyed to (but not from) hospital by service transport at public expense in accordance with K.R. & A.C.I., para. 1484, clauses 4 and 5.

2. The use of service transport in connection with non-entitled medical treatment, other than as stated above, will be on re-payment in accordance with K.R. & A.C.I., para. 1956, clause 1 (b), unless otherwise specially directed by the Air Ministry.

D.—INSTITUTIONS

170. King Edward VII Convalescent Home, Osborne.—

1. The regulations governing the admission to King Edward VII Convalescent Home of serving and other officers are given in A.M.Os., and entitlement to travelling expenses in K.R. & A.C.I., para. 3018, clause 1 (a).

2. The following cases will be excluded from the Home :—

- (a) Epilepsy and "Mental" cases.
- (b) Syphilitic cases requiring active treatment.
- (c) Tuberculosis of the lung and all infectious or contagious diseases.
- (d) Any condition which may render patients objectionable to others.

3. In cases of incurable, chronic or progressive disease or in any case of doubt, the House Governor will report to the Chairman of the Consultants' Committee with full particulars of the application. Such patients will only be admitted if, after communication with an appropriate Consultant, the Chairman of the Consultants' Committee decides that the case can be alleviated by convalescent treatment at Osborne, and that no extra or undue burden would be placed upon the Nursing Staff as the result of such admission. (See relevant pamphlet as issued to all units.)

171. Quarry House.—1. General.—Airmen, apprentices and boys in hospital or sick quarters in the United Kingdom may, in selected cases, be sent for a period of convalescence to Quarry House, St. Leonards-on-Sea.

2. *Description of club.*—Quarry House is a residential club for service and ex-service men and is intended to provide them with the opportunity of a holiday in a comfortable country house by the sea. It is not a convalescent home, and men staying there are free to do as they like, provided that they observe the rules of the club as to hours, etc.

3. *Charges.*—The charge made by the Club is 30s. per week. If the C.O. Hospital or M.O. station is of opinion that any individual who wishes to go to Quarry House is not in a position to pay this sum he may represent the case to the Air Ministry (see clause 5), stating what sum he considers the individual concerned can afford. Save in the most exceptional circumstances this should not be less than 15s. per week in the case of airmen and 7s. 6d. per week in the case of apprentices and boys. In approved cases, the balance (see clause 7 *re* travelling) will be paid out of the Patrick Alexander Trust Fund which is operated by the Air Ministry.

4. *Selection of convalescents.*—In selecting cases the following conditions will be observed :—

- (a) The airman, apprentice, or boy must not require special diet or treatment in any form.

(b) He must definitely require the change of air in order to hasten or consolidate recovery, and so expedite his return to duty.

5. *When a grant is required from the Fund.*—Except in the case of P.M.R.A.F. Hospital, Halton, where special instructions are in force, C.Os. of hospitals and medical officers in charge of sick quarters will apply direct to the Under Secretary of State (M.A.2), Air Ministry (copy to the competent medical authority) for authority to send an airman, apprentice, or boy to Quarry House, and forward the following particulars :—

- (a) Official number, rank, name, unit.
- (b) Reasons for application.
- (c) Period of stay recommended.
- (d) Suggested amount that should be borne by the Patrick Alexander Trust Fund.

6. *If no grant is required from the Fund* no application to the Air Ministry is necessary, and the airman, apprentice, or boy will be granted sick leave in accordance with the normal procedure detailed in K.R. & A.C.I., para. 1401. Application should be made direct to The Warden, Quarry House, St. Leonards-on-Sea, in order to ascertain whether the applicant can be admitted.

7. *Travelling.*—Personnel sent to the home will be treated as discharged to sick leave and entitled to ration allowance, and a half-fare concession voucher. Exceptionally the cost of the half-fare voucher may be charged against the Patrick Alexander Trust Fund should the C.O. of the hospital or medical officer in charge of sick quarters deem this course justified.

8. *Instructions to individual.*—Before proceeding, each individual will be issued with instructions in writing to report to his unit at the completion of his stay at Quarry House.

172. Industrial Training of Disabled Ex-airmen.—At Enham Village Centre facilities are available for medical treatment associated with industrial training for men disabled as the result of sickness, accident or non-infectious disease during the course of their R.A.F. service. At the conclusion of their treatment and training, permanent paid employment under sheltered conditions for men too ill or injured to take up employment under normal conditions, will be provided for certain selected cases. Application should be made by individuals requiring treatment and training direct to the London centre at :—

Enham Village Centre,
16 Grosvenor Place,
London, S.W.1.

E.—SANATORIUM TREATMENT

174. Officers and Members of Princess Mary's R.A.F. Nursing Service.—1. The circumstances in which sanatorium treatment is provided for officers and members of P.M.R.A.F. Nursing Service are laid down in K.R. & A.C.I., para. 1527.

2. Attention is directed to the differentiation observed in the regulations between treatment in a hospital and in a sanatorium, there being no authority to provide treatment in the latter for personnel other than officers and members of P.M.R.A.F. Nursing Service as referred to above.

F—SICK LEAVE

176. Sick Leave.—1. *Officers.*—(a) *General.*—Sick leave will be recommended in accordance with K.R. & A.C.I., paras. 1377 to 1384 and 1436, but only when there is a reasonable prospect that the officer will ultimately be fit to return to duty.

(b) *Venereal Disease.*—Officers desirous of obtaining treatment for venereal disease at their own risk and expense will sign the certificate required by K.R. & A.C.I., para. 1516, clause 2, but will not be granted sick leave until they have used their full entitlement to annual leave. In these cases, officers will be brought before a medical board at the expiration of their ordinary leave period. If both ordinary leave and sick leave periods have been exhausted and further absence from duty is required in order to undergo private treatment, a period on half-pay may be recommended by a medical board, provided that the officer is eligible and that there is a probability of his ultimately becoming fit for return to duty.

2. *Pupil pilots.*—Sick leave, including any period in hospital, will be as for officers but up to a maximum of twelve months on full pay for attributable disabilities and three months on full pay for non-attributable disabilities, provided there is a reasonable prospect of their being fit for full flying duties at the expiration of that period.

3. *Members of P.M.R.A.F. Nursing Service* (see A.P. 1075, para. 55.)

4. *Cadets.*—As for officers.

5. *Airmen* (see K.R. & A.C.I., para. 1401.)

SECTION VI.—HOSPITAL ADMINISTRATION

178. Objects of R.A.F. Hospitals.—R.A.F. hospitals are established for the reception and treatment of (a) officers and members of P.M.R.A.F. Nursing Service who are entitled in accordance with the regulations, (b) cadets, (c) airmen of the regular R.A.F., the Reserve and the Auxiliary Air Force, (d) entitled families of airmen, (e) personnel of the Royal Navy, Royal Marines and Army in accordance with arrangements with the Admiralty and War Office respectively and (f) civilian officials and employees. (See paras. 146 to 154.)

179. Command and Administration of Hospitals.—1. Command.—Every R.A.F. hospital is under the command of a C.O., and for the purposes of discipline and interior economy is subject to the control of the air or other officer commanding the command, group or station in which the hospital is situated.

2. Control of personnel and patients.—Except in so far as any regulations contained in this section provide, the regulations governing the Royal Air Force will apply generally to all R.A.F. hospitals and officers and airmen serving or under treatment therein.

3. Official communications.—Communications on official and service matters will not be addressed directly to officer or airman patients in R.A.F. hospitals, but will be referred, in the first instance, to the C.O. of the hospital, who will take any action required thereon if and when he is of the opinion that the state of health of the patient so permits.

180.—Hospital Establishments.—1. Officers and airmen.—

(a) An establishment of officers and airmen is provided for each hospital, and their duties will be allotted by the C.O.

(b) *P.M.R.A.F. Nursing Service.*—A separate establishment of members of P.M.R.A.F. Nursing Service is also provided, and their duties will be allotted by the matron of the hospital.

2. Temporary increase of personnel in emergency.—(a) Medical personnel.—When, from an increase of sickness, or other cause, the C.O. considers that the number of officers, members of P.M.R.A.F. Nursing Service and airmen of the medical branch doing duty in the hospital is insufficient to carry on the duties, and that the employment of additional staff is absolutely necessary, he will apply for such to the competent medical authority.

(b) *Non-medical personnel for medical duties.*—

(i) Should it become necessary to employ airmen from other units, either in lieu of or to supplement the establishment of airmen of the medical branch, which the competent medical authority is unable to supply, the air or other officer commanding is authorised to attach to the hospital temporary assistance from other trades on the application of the competent medical authority.

(ii) While so employed these airmen will not be available for other duties, nor, if it can be avoided, will they be relieved by other non-medical personnel so long as their services are required. As a general rule, only aircraft-hands will be so attached.

(iii) These airmen will not be detailed for duties involving the care of patients who are seriously ill, but their services will be utilized in assisting in the ordinary routine duties of the hospital.

(iv) Should it become necessary to change them, due notice will be given to the C.O. of the hospital. (See para. 209, clause 2 and K.R. & A.C.I., para. 1588.)

181. Allocation of Duties.—The C.O. (in his capacity as unit commander) is responsible that all officers and airmen under his command are made aware, through the medium of standing orders or otherwise, of their individual responsibilities and duties.

182. Registrar and Adjutant.—A registrar, who will also act as adjutant, will perform such other duties as may be ordered by the C.O.

183. Personal Responsibility.—Medical officers will be personally responsible for the proper treatment and care of patients and for the discipline and cleanliness of the wards under their charge. They will at once report to the C.O. or his deputy all cases of serious illness, and will cause patients, whom they consider fit for discharge, to be brought before the C.O. for his covering approval.

184. Orderly Officer.—1. *Tour of duty.*—At every hospital the C.O. will detail an orderly medical officer, whose tour of duty will, as a rule, extend to 24 hours.

2. *Officers for duty.*—Officers of the rank of flight lieutenant and below only will be called on to do this duty. If, however, the number of officers available for duty falls below three, those of the rank of squadron leader will be included in the roster. Normally the adjutant will not be detailed as orderly officer.

3. *Range of duty.*—During his tour of duty, the orderly officer will remain within easy reach of the hospital, except when called away on duty. He will keep the wardmaster informed as to where he is to be found.

4. *Next for duty.*—When the orderly officer is called away on duty, he will inform the next for duty, who will act for him in his absence.

5. *Duties.*—The orderly officer will be responsible for the following duties in addition to any others which may be imposed upon him by the C.O. :—

(a) Such of the duties set out in K.R. & A.C.I., para. 822, as are applicable to the particular hospital.

(b) He will take morning sick parade, unless another officer is detailed for this duty. He will admit all patients reporting sick after morning sick parade and also all transfers to the hospital (see paras. 282, clauses 6 and 7 and 382.)

(c) He will see that rations, diets and extras for the patients are of good quality and properly cooked and served.

(d) He will visit the kitchen after the time of the evening meal and see that the cooking utensils have been properly cleaned and put away.

(e) He will visit all wards and other parts of the hospital at least once during his tour of duty.

(f) He will investigate complaints and report any insanitary conditions observed.

(g) He will inspect the airmen's mess and visit their quarters during his tour of duty.

(h) He will perform any necessary and urgent duty towards the sick in hospital during the absence of the medical officer in charge of the case, and will deal with fresh cases of sickness as they arise.

(i) He will inspect airmen discharged, before they leave the hospital, to see that they are fit to go out and are in possession of such articles of their kits as they brought to hospital, and that all soiled articles taken by them to hospital have been washed.

6. *Report.*—The orderly officer will, when relieved, write a report of his tour of duty in a book kept for the purpose and include a statement that he has performed all his duties according to his orders.

185. Duties of a Quartermaster.—1. *General.*—In hospitals, the quartermaster's duties will correspond to those of an equipment officer of a unit and the instructions in A.P. 830, Vol. I, Appendix I will apply to him as appropriate.

2. *Equipment taken on charge.*—The quartermaster will take over, on behalf of the C.O. of the hospital, all R.A.F. equipment held on ledger charge by the hospital or on articles-in-use inventory, from the accounting unit to which the hospital is affiliated for equipment accounting purposes. He will also take over the ledger records of such equipment.

3. *Works fittings.*—He will act on behalf of the C.O. in matters of detail relating to all works fixtures and fittings (see K.R. & A.C.I., para. 1598).

4. *Receipt of equipment or supplies.*—He or his representative will invariably be present when equipment is received, and will be responsible that the quantities are correct and the quality good. He will be responsible for the certification and correctness of all bills relating to supplies and other equipment purchased locally for the hospitals.

5. *Rations and foodstuffs.*—He will be responsible for the custody of stocks of rations, for their issue under due authority, and the maintenance of the prescribed accounts. He will also be responsible for the supervision of the preparation and cooking of articles of dietary (see A.P. 112, Chap. XX).

6. *Responsibility*.—He will be responsible to the C.O. for all R.A.F. equipment and supplies held on hospital charge ; for the receipt, custody, issue and care of all hospital equipment, furniture and utensils ; for the receipt, custody and proper disposal of articles of diet and extras and of medical comforts in his store ; and for medical and, where no dental officer is posted permanently, dental equipment.

7. *Breakages*.—When breakages of, or damage to, R.A.F. equipment, have been reported to him, he will be responsible for reporting such loss or damage to the C.O. so that enquiry may be made to decide whether or not charges are to be raised against an individual or individuals.

8. *Charges*.—Charges against patients and others connected with the hospital for the loss of or damage to R.A.F. equipment will be dealt with under the procedure laid down in A.P. 830, Vol. I, Chapter 23.

9. *Duties with regard to fuel, light, etc.*—The quartermaster is responsible to the C.O. that the regulations regarding the consumption of fuel, electric current, gas and water are complied with.

10. *Supervision*.—He will supervise the duties of warrant officers, N.C.O.'s and airmen who are detailed by the C.O. to assist him in the performance of his duties in the hospital.

11. *Laundry*.—He will take care that all personal and bed linen is properly aired before it is issued to patients.

12. *Pack store*.—(a) In the hospital pack store he will see that clothing is brushed, cleaned, and carefully put on the shelves of the pack store and that the clothing is frequently aired, and all practicable steps are taken to keep it free from moth and damp. Each pack will have attached to it Form 1480 on which is shown the page number of the inventory record.

(b) He will be responsible that the pack store is at all times well ventilated.

(c) He will not allow access to the packs, nor deliver articles to patients, except under proper sanction.

13. *Hand-over of inventories*.—He or his representative will invariably be present at the handing over by one inventory holder to another. This will not relieve the outgoing inventory holder of responsibility for discrepancies which may be disclosed at a later date.

14. *Transfer of duties on change of quartermaster*.—When the quartermaster is relieved by another, the C.O. will attend, or will depute an officer to be present at the transfer. When a quartermaster is not available for duty or is on leave, a medical officer or senior N.C.O., detailed by the C.O., will carry out the

quartermaster's duties. The procedure laid down for accountant officers and equipment officers in A.P. 830, Vol. I, will be followed.

(For Pack Store duties, *see* para. 199, monthly costing of diets, para. 203, games for patients, para. 211, exchange of clothing, bedding and laundry, para. 252, inventory procedure, para. 254, loan cards, para. 287, ledger procedure, para. 288, personal equipment of patients, para. 297, patients' kits, para. 309, inventory of fixtures, para. 310, and stock-taking, para. 311.)

186. The Warrant Officer.—The warrant officer (or, if there is no warrant officer, the senior N.C.O.) will supervise the duties of the hospital establishment under him and be responsible for the discipline of both patients and attendants, but he will be careful, in carrying out his duties, not to interfere with the duties assigned to the matron and members of P.M.R.A.F. Nursing Service. He will be in general charge of the hospital office.

187. Training of Nursing Orderlies—Courses of Instruction and Duties in Connection therewith.—1. *The training officer (medical).*—The co-ordination of instruction for recruits, specialist trades and promotion, the examinations for these purposes, and the maintenance of uniformity throughout, is vested in the training officer (medical). (*See* para. 293.)

2. *Courses.*—The following courses of instruction for medical airmen are carried out in hospitals :—

(a) Part II of the recruits remustering course to nursing orderly (6 months).

(b) Reclassification course for nursing orderlies (6 months).

(c) Courses for specialist trades.

3. *Assistant training officer (medical).*—In each hospital an officer in charge of training is nominated by the C.O. He is responsible for arranging classes and, in addition to himself, lecturers on the subjects of the several syllabuses.

4. *Lectures by members of P.M.R.A.F. Nursing Service.*—The matron of the hospital, or a sister of the P.M.R.A.F. Nursing Service, will give the lectures of the syllabuses ordinarily given by a member of the nursing service.

5. *General.*—Great importance is attached to the training of nursing orderlies as leading aircraftmen, and every assistance will be given to them to obtain this classification. To this end medical officers and sisters in charge of wards will not allow the services of nursing orderlies to be utilized for any but

nursing duties and routine ward work, and will afford them as much practical demonstration and encouragement to learn as is possible. (See A.P. 1112.)

188. Rationing of the Hospital Staff.—Rations for officers and airmen borne on the hospital establishment and also for officers and airmen attached for duty in the hospital will be drawn, issued and accounted for in the same manner as in other units. Where the airmen are messed separately from the remainder of the station personnel, a messing account for airmen, Form 848, will be kept, and the commuted ration and cash equivalent allowances will be drawn as laid down in K.R. & A.C.I., Chapter XXXIV.

189. R.A.F. Equipment in Hospitals.—1. A hospital is equipped, as far as may be necessary, in accordance with hospital equipment scales in A.P. 830, Vol. III.

2. The general responsibility of the C.O. for R.A.F. equipment issued to the hospital is governed by K.R. & A.C.I., paras. 72 and 2388.

190. C.O. of Hospital to Inspect R.A.F. Equipment.—The C.O. or an officer detailed by him, will inspect all R.A.F. barrack, medical, and dental equipment and supplies on charge to the hospital at frequent intervals, and will carry out such checks as may be necessary to satisfy himself that the accounting, maintenance, and disposal of materials are in accordance with the regulations (see K.R. & A.C.I., para. 72).

191. Local Purchase of Additional Articles for Hospitals.—1. *Scale.*—The following allowances will be made to hospitals staffed by P.M.R.A.F. Nursing Service, in which the total approved accommodation is not less than 100 beds :—

(a) An initial allowance, not exceeding 5s. for each bed, for each new hospital.

(b) An initial allowance, not exceeding 5s. for each bed, added by Air Ministry authority to existing hospitals.

(c) A subsequent allowance, for maintenance and additional purchases, not exceeding 1s. a year for each bed.

2. *Payment.*—(a) These allowances will not be issued in cash, but will be expended in payment of bills incurred by C.Os. of hospitals in the purchase of :—

(i) Articles of equipment (additional to those allowed by the approved schedules of hospital equipment) calculated to afford increased comfort to the sick.

(ii) Small useful or decorative articles to improve the appearance of the hospital wards and brighten the hospital surroundings.

(b) Both the initial and annual allowances will not be issuable in the same financial year. Any sums not actually disbursed in the financial year in which the allowance is issuable cannot be added to the allowances for the ensuing financial year, and must be regarded as forfeited.

3. *Responsibility*.—Purchasing officers will be held responsible that the money is expended solely for the purpose detailed in clause 2. They will be held personally liable for :—

(a) any expenditure incurred in the purchase of articles which the air or other officer commanding may consider unsuited for the purposes for which the allowances are granted.

(b) any expenditure in excess of the initial or annual allowances.

All bills will, before payment, be submitted to the air or other officer commanding for approval.

4. *Accounting*.—The articles purchased from these allowances will be taken on ledger charge and accounted for as other R.A.F. equipment. All bills will be submitted for payment to the accountant officer paying hospital services, and will be supported by a certificate to the effect that the articles have been taken on charge, quoting the voucher number.

5. *Repairs*.—Any necessary repairs which can be executed in local R.A.F. workshops may be carried out at the expense of the public, provided the cost of repair is reasonable, having regard to the original value of the article. Replacements of equipment purchased from these allowances will not be made from R.A.F. stocks.

192. *Cubic Space of Wards*.—1. The number of beds which each ward is capable of accommodating is recorded on Form 1251, and this number will not be exceeded, except in emergency, without Air Ministry sanction. At stations in the United Kingdom, the superficial area and cubic space allowed for each bed are :—

	<i>Floor space.</i> sq. ft.	<i>Cubic space.</i> cu. ft.
Permanent hospitals, ordinary wards	100	1,200
Permanent hospitals, infectious wards	150	1,800
Detached wooden huts, all wards ..	75	900

2. When a hospital is not fully occupied, the sick will be distributed so as to allow as much space as possible beyond the amount specified in clause 1, which should be regarded as the minimum, having regard to economy in labour and consumption of fuel and light.

193. Dining Rooms in Hospitals.—In hospitals where dining rooms exist, or can be made available, the meals of all patients able to leave the wards will be served in the dining rooms and not in the wards.

194. Repairs to Buildings.—Where there is no local works officer at the station, or where reference would cause delay which would be detrimental to the patients, the C.O. of a hospital is empowered to order urgent and necessary minor repairs (such as the repair of roofs, electric or gas supply, waterpipes, and closets and the replacement of broken glass) to be executed at once by the contractor or his agent, or in the contractor's default or absence, by some other tradesman. The C.O. will, however, send a copy of his order simultaneously to the works officer. For all other repairs, K.R. & A.C.I., paras. 1853 and 1855, clause 1, will apply.

195. Hospital Gardens.—Where necessary one airman, borne against the hospital establishment, may act as gardener, and the necessary tools will be obtained from the appropriate equipment depot, through the equipment officer of the accounting unit (if applicable). All demands for the proper maintenance and repair of enclosures will be made on the local works officer.

196. Transfer and Handing Over.—Whenever the C.O. of a hospital is relieved, the transfer of responsibility will be effected in accordance with K.R. & A.C.I., para. 73, and A.P. 830, Vol. I, Chapter 12, paras. 1 and 2.

197. Clearance Certificate.—1. Before an officer, member of P.M.R.A.F. Nursing Service, airman, civilian official or employee is permitted to leave a hospital where he has served as part of the establishment, he will be required to produce a clearance certificate on Form 578, which will be dealt with as directed in A.P. 830, Vol. I.

2. The C.O. will be responsible that a manuscript clearance certificate is completed before a patient is discharged from hospital. These certificates will be drawn up to suit local conditions.

198. Medicines for Families, and Entitled Civilians.—The C.O. of a hospital will be responsible that all medical equipment required for officers and their families, and the families of airmen and others who are allowed medical attendance (*see* Section III of this Chapter), are supplied from the dispensary of the hospital. He will arrange for the dispensing of prescriptions, and the issue of medicines at fixed hours, so as not to interfere with the working of the hospital. In cases of urgency medicines will be supplied at any time, but such prescriptions must be marked "urgent" by the prescribing officer.

199. Hospital Pack Store.—1. In hospitals where the employment of a N.C.O. as pack store-keeper, or linen store-keeper, is specially authorised, such N.C.O. will perform, under the quartermaster, the duties laid down in para. 185, clause 12. In no circumstances will these duties be delegated to an aircraftman.

200. Hospital Returns.—1. *Daily Bed State.*—(See para. 318.)

2. *Weekly Sick Report.*—The C.O. of a hospital will render a weekly sick report (Form 38) in accordance with the instructions contained in para. 255.

3. A monthly return of airmen in hospital in the United Kingdom for more than three months (see para. 322).

201. Account of Hospital Charges in respect of Patients.—The C.O. of a hospital will be responsible that Form 1643, notifying the period spent in hospital and the amount of hospital charges (where recoverable), is rendered in accordance with the instructions on the form. For the purpose of calculating hospital charges, a charge will be normally made for the day on which discharge from hospital or sick quarters occurs, but not for the day of admission (see para. 314). When, however, an airman or a member of his family is treated at the public expense in a civil hospital, charges will be calculated in accordance with K.R. & A.C.I., para. 1545, clause 3. (See K.R. & A.C.I., para. 3471 with regard to computation of time.)

202. Admission to Hospital.—1. *General.*—See K.R. & A.C.I., para. 1605.

2. *For injuries.*—The hospital will inform the unit concerned as soon as possible when an officer or airman is admitted direct to hospital in consequence of injuries (except by wounds received in action) in order that the unit may render a Form 551 and a court of inquiry be assembled if necessary, in accordance with K.R. & A.C.I., para. 1325. (See K.R. & A.C.I., para. 2312.)

203. Foodstuffs, Diets and Extras.—1. *Accounting.*—Foodstuffs will be obtained, diets and extras issued, and accounting procedure carried out in accordance with the instructions and scales laid down in K.R. & A.C.I., paras. 2670 and 2673 and A.P. 112.

2. *Duties of medical officers.*—(a) Medical officers will give particular attention to the selection of diets and extras suitable, both in kind and quantity, for the treatment of individual cases, and will, in all serious cases, give precise instructions as to the hours at which food and stimulants will be administered. They must bear in mind that, although no specific instructions can be laid down in regulations as to the

circumstances in which extras should be ordered, all necessary economy, compatible with the well-being of the patient, should be practised, in order that undue or injudicious issues of extras may be avoided.

(b) If patients detained in, or admitted to, hospital require additional nourishment before they are placed on hospital diet, such extras as are necessary will be ordered.

3. *Supervision.*—The C.O. will exercise the closest supervision over hospital foodstuffs and will satisfy himself that they are of good quality, and in accordance with the contracts.

4. *Stocktaking.*—The C.O. will detail in daily routine orders a medical officer to take stock of all items remaining on the diet account after all issues have been made on the last day of each month. Any discrepancies revealed will be brought to the notice of the C.O.

5. *Monthly costing of diets.*—In order to keep a check on the cost of diets, quartermasters will supply the C.Os. with a monthly statement.

204. Hours of Meals in Hospitals.—The C.O. will arrange the hours for all meals to suit local requirements, regard being given to the fact that patients should not be left too long a time without nourishment, especially between tea and breakfast.

205. Orders for Patients.—See para. 268.

206. Warrant Officer Patients.—Patients of the rank of warrant officer will receive no free issue of hospital clothing or necessaries and will therefore be permitted to retain such items of their own clothing and necessaries as they may require for their personal use (see para. 309).

207. N.C.O. Patients to Wear Chevrons.—A N.C.O., while a patient in hospital, will wear chevrons denoting his rank, on his hospital clothing. When he is confined to bed, the chevrons will be placed over his bed head-board.

208. Employment of Patients on Light Duties.—The C.O. may employ on light duties, patients whom he considers able to assist the hospital establishment, but convalescent patients will not be retained as patients specially for this purpose.

209. Offences in Hospital.—1. *Patients.*—Offences committed by patients in hospital will be dealt with as directed in K.R. & A.C.I., para. 1131.

2. *Non-Medical personnel.*—When an airman who is temporarily employed in a hospital in accordance with para. 180, clause 2, and K.R. & A.C.I., para. 1588, clause 2, is placed in

arrest, the hospital will at once report the circumstances to the airman's unit for action, unless the airman's service documents have been handed over to the hospital, when the C.O. of the latter will himself dispose of the charge (*see* K.R. & A.C.I., para. 1120).

210. Personal Requirements of Patients.—The C.O. of a hospital will make arrangements for the supply to patients, subject to his approval, of such articles as writing materials, tobacco, &c. (*see* K.R. & A.C.I., para. 2834 with regard to payment).

211. Games for Patients.—All games (*e.g.* chess, etc.) in the hospital library or reading room will be in the custody of the quartermaster.

212. Visitors.—The C.O. may allow visitors to patients at hours convenient to the hospital routine.

213. Administration of General Anaesthetics.—1. When the administration of a general anaesthetic is necessary and circumstances permit, the consent of the parent or guardian will be obtained in writing on Form 41 for patients under the age of 18 years or from the patient himself if 18 years of age or over.

2. In cases arising abroad, consent from the parent or guardian need only be obtained when delay so arising would not be injurious to the patient or cause unnecessary and prolonged retention in hospital or sick quarters.

214. Mechanical Restraints for Mental Cases.—1. *General instructions.*—Mechanical means of bodily restraint will not be applied to any mental patient unless the restraint is necessary for purposes of surgical and medical treatment, or to prevent him from injuring himself or others.

2. *Approved forms of restraint.*—Only the approved forms of restraint, as shown below, may be employed:—

(a) A jacket or dress, made of strong linen or some other strong material—

(i) laced or buttoned down the back having long outside sleeves fastened to the dress only at the shoulders, with closed ends to which tapes may be attached for tying behind the back when the arms have been folded across the chest:

(ii) of some other pattern approved under the seal of the Board of Control.

(b) Gloves without fingers so fastened at the wrists that they cannot be removed by the wearer, and made of linen, leather, or some strong material, padded or otherwise.

(c) Sheets or towels, tied or fastened to the sides or ends of a bed or to other objects.

3. *Supervision of patients.*—It is essential to the safe employment of any of these forms of restraint, except (b), that the patient should be visited frequently by a medical officer, be kept under continuous special supervision by an attendant, and that he should under no circumstances be left unattended.

4. *Certificate.*—In every case where such restraint is applied, a certificate will be completed and signed by the medical officer describing the mechanical means used, and the grounds upon which the certificate is founded.

5. *Record of use.*—A full record of every case of restraint by mechanical means will be kept from day to day, and in the United Kingdom a copy of the records and certificates sent to the competent medical authority for transmission to the Secretary, Board of Control, London, at the end of every quarter.

215. Seriously and Dangerously Ill Patients.—When a patient becomes seriously or dangerously ill, the hospital will inform the patient's unit of the fact by signal, and will include a recommendation in accordance with K.R. & A.C.I., para. 3032, if applicable. The competent medical authority of the command in which the hospital is situated, and the chaplain of the denomination to which the patient belongs will also be informed at once. When the patient is removed from the dangerously ill or seriously ill list, further notification will be made immediately to the unit and the competent medical authority.

216. Deaths.—1. When a patient dies in hospital, the hospital will inform the patient's unit by telegram, giving place, date and cause of death and the date and hour after which the interment may take place.

2. The competent medical authority of the command in which the hospital is situated, the C.O. of the station, and the chaplain of the denomination to which the patient belonged will also be informed.

3. Similar reports will be rendered when a dead officer or airman is brought to hospital.

4. Deaths due to violence or unknown causes will also be reported to the coroner.

217. Certificates for Friendly Societies.—Upon the written application of any established friendly society, the C.O. of a hospital will furnish to the society a certificate as to the nature of the illness from which any airman, who is a member thereof, may be suffering, together with the date of admission and date of discharge, provided the written consent of the airman has first been obtained.

SECTION VII.—DENTAL SERVICES

230. Duties of Dental Officers.—1. Instructions relating to the duties of dental officers are contained in K.R. & A.C.I., Chapter XIX, Section VI (*see also* paras. 11, 12 and 14).

2. *Hours of duty.*—Treatment will, as a rule, be carried out for not less than five and a half hours daily, within the normal working hours of the station, and divided into morning and afternoon sessions when necessary. The times will be arranged after consultation with the C.O. of the unit concerned.

3. *Leave of absence.*—Dental officers will not be absent during normal hours of duty without prior authority of the C.O. of the station and with the permission of the senior dental officer, if one is at the station.

231. Employment of Civilian Dental Surgeons.—The regulations relating to, and the fees allowed for dental treatment carried out by civilian dental surgeons are contained in K.R. & A.C.I., paras. 1571, 1572 and 1573.

232. Standards of Dental Fitness.—

1. Officers (*see* A.P. 130).
2. Cadets (*see* A.Ps. 121 and 130).
3. Pupil pilots—as for officers.
4.

<ol style="list-style-type: none"> (a) Recruits. (b) Apprentices (c) Boy entrants 	}	(<i>see</i> A.P. 1129).
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233. Persons Eligible for Dental Treatment.—1. Officers (*see* K.R. & A.C.I., paras. 1563 and 1564, and A.M.Os. A.550/25 A.320/35).

2. Members of P.M.R.A.F. Nursing Service (*see* K.R. & A.C.I., para. 1565).

3. Airmen (*see* K.R. & A.C.I., para. 1566).

4. Families (*see* K.R. & A.C.I., paras. 1574 and 1575).

5. Civilian officials and employees (*see* A.P. 826, para. 185).

(*Note.*—The regulations do not provide for dental treatment for cadets and pupil pilots except when it is necessitated by an injury attributable to conditions of service).

234. Daily Record of Dental Treatment.—The instructions for keeping the daily record of dental treatment are laid down in para. 291. (*See* para. 326 with regard to notification of airmen to attend for dental treatment.)

235. Refusal of Treatment.—(*See* para. 259, clause 3 (g) (vi).)

236. Interrupted Treatment.—When any treatment is interrupted owing to the officer or airman being posted to another unit, the dental officer will notify the dental officer (or medical officer if no dental officer is available) of the new unit.

237. Records of Dental Inspections.—Full details of all treatment required noted at dental inspections, will be kept by dental officers in a special book. This will also enable statistics to be supplied for Form 676.

238. Dental Treatment of R.A.F. Personnel by Royal Naval and Military Dental Officers and of Royal Naval and Military Personnel by R.A.F. Dental Officers.—(See K.R. & A.C.I., para. 1576.)

239. Provision of Porcelain Crowns.—1. Except where the loss of teeth necessitates the provision of an artificial denture, porcelain crowns may, subject to the approval of the inspecting dental officer in the United Kingdom or competent medical authority abroad, be fitted by dental officers in such cases as accidental fracture or extensive decay of incisor or canine teeth, if the root can be made sterile.

2. On approval being granted, Form 1209 will be completed in triplicate, and two copies forwarded, through the usual channels, to the Air Ministry, the date and authority for supply being given. The third copy of Form 1209 will be retained by the station dental officer who will take the crowns on charge in the dental equipment account (Form 823) and expend them on a fair wear and tear certificate supported by a Form 632 (see para. 284).

240. Provision of Dentures.—1. The instructions relating to the provision of dentures at public expense are laid down in K.R. & A.C.I., para. 1568. The dental officer will be responsible for the careful packing of plaster models and dentures and the marking of models and impressions when forwarding them to the dental mechanical laboratory. (See para. 241.)

2. The instructions relating to the provision of dentures on repayment are laid down in para. 286.

241. The Dental Mechanical Laboratory.—1. The senior dental officer at No. 1 R.A.F. Depot will, in addition to his other routine duties, be in charge of the dental mechanical laboratory. He will keep a record, in a suitable book, of all details relating to denture work undertaken in the laboratory; each case will be accorded a "case number", and record will be made of the name and rank (and airman's official number) of every officer and airman for whom denture work is done.

2. He will, where he considers the supply of a denture unnecessary, refer the case to the dental officer at the station concerned for reconsideration.

3. Losses or deficiencies of dental appliances, or of materials, will be dealt with in accordance with K.R. & A.C.I., paras. 1644 to 1646.

242. Oral Hygiene.—1. Dental officers will impress upon all ranks the importance of keeping the teeth and gums in a sound and healthy condition, and will take every opportunity of seeing that the principles of oral hygiene are understood and carried out.

2. When a dental officer considers that an airman is not giving sufficient care to the cleanliness of his teeth, he will bring the matter to the notice of the C.O. of the unit.

243. Training of Dental Airmen.—(See K.R. & A.C.I., Chapter IX, Section II and para. 472A.)

244. Change of Dental Officer.—1. Whenever the dental officer of a station is changed, the incoming officer will make a thorough inspection of the dental records and will give a receipt for them to his predecessor for transmission to the competent medical authority. A certificate will be added to the receipt stating that the records are complete and in proper order, or, if they are deficient, giving details of the deficiencies.

2. Similarly the incoming dental officer will take stock of all dental and barrack equipment and report any discrepancies found between actual stock and the accounts (*see* para. 389, clause 2).

245. Closing of Station.—1. Whenever a station is closed, the dental records will be forwarded to the competent medical authority, who, after scrutiny, will transmit them to the Air Ministry.

2. Instructions with regard to dental equipment will be given by the competent medical authority.

3. Barrack equipment will be returned to the unit equipment stores.

CHAPTER III

INSTRUCTIONS FOR THE PREPARATION AND
DISPOSAL OF RECORDS AND RETURNS

SECTION I.—INSTRUCTIONS FOR THE USE OF FORMS

250. General Description and Instructions.—1. The Royal Air Force system of recording medical findings is the outcome of many years' study and amendment, and none of the information required on the various forms is unimportant ; it is therefore essential that medical officers completing these forms shall do so conscientiously and accurately, as an omission or misstatement may, even after a lapse of many years, cause an injustice to the subject or the State, as, for example, on a claim in respect of a pensionable disability.

2. *Card and flimsy forms.*—(a) *Description.*—Of the forms described, Forms 35, 39, 42, 46, 473 and 826 are in duplicate, each consisting of a card and flimsy. They will be completed from Forms 36, 41, 43, 47, 474 and 827 respectively, which will be retained at the establishment where they are compiled, as office records, except as required by para. 258, clause 2, with regard to Forms 46 and 47, and para. 340 with regard to procedure on active service.

(b) *Disposal.*—The disposal of the card and flimsy is as follows :—The flimsy will be placed in the relevant Form 48 and the card retained until the end of the week and then forwarded to Air Ministry through the competent medical authority, except as required by para. 253, clause 3, with regard to Forms 35 for Reservists. If the relative Form 48 is not held at the unit rendering the card and flimsy, the latter will be forwarded to the unit holding the Form 48. When it is not known where the relative Form 48 is held, the flimsy will be forwarded to the competent medical authority for disposal.

3. *Stocks of forms.*—Large stocks of unused forms will not be kept in view of the fact that amendments are frequently made, thus rendering those in stock obsolescent. The month and year of printing are usually noted at the foot of each form thus : " 8/37 ". Old stock will be amended in accordance with the latest available print. When complementary forms (e.g. Forms 42 and 43) are used, the older form will always be amended, if necessary, to correspond with the more recent form.

4. *Typing.*—All forms are spaced for typing and will be completed in type whenever possible.

5. *Records of age.*—When the age of an individual is required to be recorded, that at the last birthday will be given.

6. *Signatures.*—Signatures on all forms will be in manuscript.

7. *"Nil" Returns.*—Form 24 will be used for "Nil" returns.

8. *Amendments.*—Suggestions and recommendations for the amendment of forms may be forwarded to the Air Ministry through the competent medical authority.

251. Form 23.—Quarterly List of Persons Entitled to Medical Attendance by Civilian Medical Practitioners.—This return gives a list of all persons entitled to medical attendance, and will be forwarded by the C.O. of the station on the first day of each quarter to the civilian medical practitioner employed in accordance with K.R. & A.C.I., para. 1548.

252. Form 29A.—Certificate of Exchange of Soiled Hospital Clothing and Bedding for Clean.—1. *Internal exchange.*—(a) Form 29A, completed in duplicate, will be used within the hospital for the exchange of linen from the wards. If for any reason the quartermaster or his representative is unable to exchange all the articles, he will make a note of such articles on the back of the form and sign it. A temporary receipt will be given to the ward for the articles which have not been exchanged.

(b) Forms 29A compiled by the wards will be retained by the quartermaster to support the Form 29A forwarded by him to the equipment officer.

(c) The quartermaster or his representative will inspect all articles of bedding, linen, clothing and personal hospital equipment brought from wards for exchange. If any article is found damaged or stained in consequence of apparent neglect, he will draw the attention of the person delivering it to the fact and will make a note on the appropriate Form 29A. A report will be made to the C.O. in order that the circumstances attending the damage or staining may be investigated and, if necessary, the amount of the damage assessed and charged to the individual at fault.

2. *External exchange* (a) *When a hospital is not a self-accounting unit for equipment purposes.*—The quartermaster will prepare and sign Form 29A in triplicate for the necessary periodical exchanges of hospital bedding, linen and clothing. The original copy of the Form 29A will be forwarded to the equipment officer of the accounting unit with the articles to be exchanged, the duplicate to the accountant officer and the triplicate retained by the quartermaster.

(b) When a hospital is authorised to send soiled articles direct to the washing contractor, the receipt of the contractor or his representative, for the articles sent, will be obtained on the original copy of Form 29A. The original copy bearing the contractor's receipt will thereafter be sent to the equipment officer of the accounting unit, and the articles enumerated thereon drawn in exchange.

(c) If the equipment officer is not able to give an equal number of clean articles in exchange, the quartermaster will obtain a temporary receipt for the articles not replaced. The number (in words) and description of such articles will be noted on the back of Form 29A held by the equipment officer.

(d) *When a hospital is a self-accounting unit for equipment purposes.*—The procedure detailed in A.P. 830 Vol. I, Chapter 26, adapted as stated in clause 7, will be followed. Copies of the Hospital Washing Book, Form 25A, will be maintained by the quartermaster and by the officer responsible for the payment of the washing contractor's bills.

3. The quartermaster or his representative will ensure that all articles received in exchange from the equipment officer or returned by the washing contractor, have been properly washed and mended and are correct as to quantity.

253. Forms 35 and 36.—Examination of Non-flying Personnel.—Medical Record.—For the general description and disposal of the form *see* para. 250. These forms will be rendered for the following medical examinations :—

1. *Recruits (including apprentices and boy entrants) on entry or reservists rejoining for regular service.*—The medical examination of a recruit, or a reservist rejoining for regular service from the reserve, will be recorded in the first instance on Form 36, which will be completed and retained by the Recruiting Medical Officer. If the recruit or reservist is found fit for service, Form 35 will be prepared from Form 36. For a recruit, Form 35 (card and flimsy) will then be forwarded to the Officer i/c Records, who, after the recruit has been attested, will insert his official number on the card and flimsy and dispose of them as follows :—

(i) The flimsy as directed in K.R. & A.C.I., para. 2168.

(ii) The card to the Air Ministry.

For apprentices and boy entrants Forms 35 will be passed to the competent medical authority who will pass the cards to Air Ministry and the flimsies to the Officer i/c Records for the completion and insertion in Form 48.

2. *Airmen (except airman pilots) on loan to Dominion, Colonial and Foreign Governments.*—(a) The forms will be headed "Airman on loan to dominion (colonial or foreign) government".

(b) A full detailed examination, as indicated on the forms, will be made and under section D any disability present will be recorded in full, the reverse of the form being used if necessary.

(c) The assessment will be recorded as "Fit" or "Unfit" Grade I or Grade II (General Service or Home Service only). Form 35 will be disposed of in accordance with para. 250, clause 2 (b) and Form 48 forwarded to the Officer i/c Records.

3. *Airmen on transfer to the Reserve.*—(a) *First Examination.*—An airman whose engagement includes a period of Reserve service will be medically examined by the medical officer of his unit six months before he is due to be transferred to the Reserve, to ascertain his fitness for service in the Reserve. Any treatment (including dental treatment) found necessary to correct minor disabilities will be undertaken without delay, so that it will be complete by the time he is transferred to the Reserve. If in the opinion of the medical officer the airman is unfit for service in the Reserve, he will normally be retained to complete his regular service, provided he is fit to do so, but he will not receive dental treatment unless it is urgently required. An airman who is considered unfit for retention, or who claims to be suffering from a disability, will be brought before a medical board with a view to invaliding in accordance with para. 86. If a board is unnecessary, Form 35 (headed "Examination on transfer to the Reserve") will be completed in detail to record the result of the examination, the words "residence" and "previous occupation" being amended to read "unit" and "R.A.F. trade" respectively. The results obtained will be compared with those recorded on Form 35 on entry, and any deterioration will be noted by the examining medical officer. Airmen who require medical or dental treatment will be re-examined on its completion, the results being noted on the reverse of Form 35 by the medical officer of the unit. Both the card and the flimsy of Form 35 will be placed in Form 48.

(b) *Airmen serving on engagements for regular service only* for periods up to and including 12 years' service, who are required in the Reserve, will be invited by the Officer i/c Records, six months before they are due to be discharged, to execute an extension of service or prolongation of engagement to allow of 4 years' service in the Reserve. Action will be taken as in clause (a) above with the addition that the medical certificate on Form 82 will be completed in respect of them. If an ex-apprentice is found at any examination under this paragraph to be unfit for full service, the fact will be reported forthwith to his C.O. for transmission to the Air Ministry

but he will not be brought before a medical board with a view to invaliding before instructions have been received from Air Ministry.

(c) *Second examination.*—Immediately before the airman leaves the unit, a further note will be made on both card and flimsy at "Final Examination" confirming that the airman's condition has not altered since the form was completed, or recording any change which is discovered. The flimsy will be reinserted in Form 48 and the card disposed of in accordance with para. 250, clause 2 (b).

4. *Reservists (non-flying)* when called up for training (*see* A.P. 938, para. 223 (i)).

The flimsy of Form 35 for a reservist reporting to a mobilization pool will be passed to the Records Officer of the pool. For a reservist reporting direct to his unit the flimsy will be enclosed in his Form 48 by the medical officer, and in both cases the card will be disposed of as at clause 1 (a) (ii) above (*see* A.P. 1096, para. 226).

254. Form 37.—Inventory of R.A.F. Equipment.—All articles of equipment (Classes "A" and "B" both medical and barrack) issued to the wards or departments of a hospital will be recorded on inventory Form 37. The inventories will be dealt with in accordance with the procedure laid down in A.P. 830, Vol. I, Chapter 10, para. 54 *et seq.*, and will be prepared by the quartermaster for each ward or department and forwarded to the inventory holder. The inventory will be kept in the ward or department for reference. Medical equipment will be shown on a separate Form 37 to that on which other R.A.F. equipment is recorded.

255. Form 38.—Weekly Sick Return.—1. *General Instructions.*—This is bound in book form and consists of alternate flimsy and thick sheets, each flimsy sheet being detachable. All personnel who have been non-effective sick during the week ended midnight on Friday of each week will be entered on the form, but, in the case of families, Form 38 will be completed only by R.A.F. hospitals and by certain sick quarters specially authorised by the Air Ministry for the treatment of families. The form will be prepared as a weekly sick report by unit medical officers and C.Os. of service hospitals, a separate book of forms being maintained for each class of patient enumerated in clause 3.

2. *Preparation*—(a) *By unit medical officers.*—As a weekly sick return, the flimsy sheets being forwarded to the competent medical authority not later than noon on the Saturday of

each week. When the flimsy sheets have been detached, the thick sheets serve as a permanent record for the establishment concerned.

For the purposes of the return he will obtain from the C.O. the strength of each unit at the station on the day on which the return is completed.

(b) *By C.Os. of R.A.F. hospitals.*—As a weekly sick return in accordance with (a) above. The limiting period of 48 hours' sickness, which applies to patients in sick quarters, will not apply to patients in hospitals, except that if a case sent from a unit to a R.A.F. hospital situated at the same station is not likely to require treatment beyond a period of 48 hours, he will be "detained" only in the hospital, but, if after 48 hours he should still be found unfit for duty, he will be admitted to hospital (as from the date he was first detained).

(c) *By competent medical authorities.**—

(i) *Patients in civil institutions.*—Personnel serving in the regular air force who are admitted to civil institutions, will be shown on separate Forms 38 for each institution.

(ii) *Patients in Royal Naval hospitals.*—The competent medical authority, will be responsible for the collection of Forms 38 (flimsy) in respect of admissions to naval medical establishments, whether embarked or disembarked.

(iii) *Patients in Military hospitals.*—The competent medical authority will be responsible for the collection of Forms 38 (flimsy) for all air force personnel admitted to army hospitals in the United Kingdom.

(iv) *General instructions.*—The competent medical authority will retain all the Forms 38 received for the weekly periods of each quarter. He will complete the returns as far as possible from the Forms 39, inserting any changes of diagnosis necessary, and will forward the Forms 38 to the Air Ministry one month after the completion of each period (*viz.*, on 1st May, 1st August, 1st November and 1st February), accompanied by a nominal roll in duplicate of all officers and airmen in the command who are in hospitals or sick quarters on the last day of the period: the names will be grouped under the hospitals and sick quarters concerned.

(d) *By the senior medical officer of an independent group or wing.*—A senior medical officer of an independent group or wing will not retain Forms 38 as laid down in clause 2 (c) (iv) but will forward them to the Air Ministry as soon as they have been received and checked.

* At home, the Officer i/c Medical Statistical Office, Ruislip, will carry out these duties.

3. Compilation—General Instructions.—(a) *Categories of patients.*—Separate forms will be completed weekly by each R.A.F. station in the United Kingdom and abroad as follows :—

(i) Personnel serving in the regular air force who are admitted to sick quarters or hospital.

(ii) All other persons who are admitted to sick quarters or hospital.

(iii) Any other particular category of patient as may be specifically directed by the Air Ministry.

(b) *Categories of units.*—Separate forms will, in addition, be completed by each R.A.F. station in the United Kingdom only when applicable as follows :—

(i) For a unit belonging to a different command, or a formation of not less than one flight attached for a period of one week or more.

(ii) For a unit belonging to a different group of the same command, or a formation of not less than one flight attached for a complete period of one week or more.

(c) *Portions of units.*—

(i) Personnel, numerically less than one flight, detached from one unit and attached to another, will be shown on the Form 38 of the unit and command respectively which affords the medical treatment.

(ii) A party or flight detached from its parent unit and not attached to another will be treated as an independent unit and will require a separate Form 38.

(d) *Individuals in special circumstances.*—

(i) *Officers sick on leave.* An officer sick on ordinary leave, but returning to duty on completion of such leave, will not be shown on a Form 38, although a Form 39 should be completed whenever possible (see clause 3 (d) (iv) below and para. 256, clause 4 (a)).

(ii) An officer unable, through illness, to return to duty on completion of ordinary leave will be shown on the station Form 38 with effect from the date of the expiration of the ordinary leave (but see (iv) below), and will continue to be shown until he is discharged to duty or to a medical board or is transferred to a service hospital.

If, however, during the period of his leave (but see (iv) below), he has been admitted to a civil institution at his own expense, no record will be made on Form 38 of this

admission, although he may remain non-effective sick after the date of the expiration of his ordinary leave. (See para. 256, 4 (a) with regard to completion of Form 39.)

(iii) *Airmen sick at home or on leave.*—An airman sick at home or sick on leave will be shown on the station Form 38 with effect from the date of his becoming non-effective, and will continue to be so shown until he is returned to duty, or transferred to a service hospital or to a civil institution.

(iv) *Personnel sick in the United Kingdom while on leave from abroad.*—An officer or an airman, sick at his home while on ordinary leave in the United Kingdom from a command abroad, will be shown on a separate Form 38 headed "Sick on leave from abroad" by the S.M.O. of No. 1 R.A.F. Depot, Uxbridge, and will continue to be shown until he is discharged to complete his leave or is transferred to a service hospital or to a civil institution.

(v) *Personnel retained in hospital on termination of regular service.*—An officer or an airman retained in hospital for treatment after the termination of his regular service, will be struck off the Form 38 for regular air force personnel and entered on the Form 38 for "Miscellaneous" patients.

(vi) *Individual personnel treated at units other than their own.*—An officer or an airman who is treated in sick quarters other than his own, while on duty other than on attachment (see clause 3 (c) (i)) or on leave, will be reported immediately by the medical officer affording treatment to the medical officer of the individual's parent unit for inclusion in the relevant Form 38.

4. *Compilation—Detailed Instructions.*

SECTION I.—(a) *Cases of more than 48 hours duration.*—Full details of all personnel who are sick for a period of more than 48 hours (but see clause 3 (d) (iv) above) will be recorded in this section. Each case will be allotted a serial number, the first new case in the year commencing 1st January, being given the number "1", and the series continued to the end of the year.

(b) *Continued treatment.*—In the case of personnel who have been discharged from medical establishments to duty, to ordinary leave, or to sick leave, with a view to their readmission to hospital or sick quarters at a future date for further treatment on account of the same disability, the serial number of the readmission will be prefaced with the letters "C.T.", to indicate "continued treatment". These cases do not include definite relapse cases, e.g. malaria, relapse. (See para. 266 as to recording these cases on Form 241.)

(c) *Cases transferred to hospital.*—Cases transferred from sick quarters or hospital to another hospital will be entered in section I, irrespective of the duration of their stay.

(d) *Disposal.*—The “How disposed of” column of the flimsy sheet will be completed at the end of the week as follows :—

(i) For cases admitted and discharged to duty during the week, the word “Duty” will be entered.

(ii) For cases admitted during the week and still remaining at the establishment, the column will be left blank for completion by the competent medical authority.

(iii) For cases admitted during the week and transferred elsewhere for treatment, the name of the establishment to which they have been transferred and date of transfer, will be recorded.

(iv) In case of death, the word “Died” and the date of death will be entered.

(e) The “How disposed of”, “Date of discharge” and “Number of days sick” columns of the thick sheet will be completed from Forms 39 as and when the patient leaves the establishment compiling the form, thus forming a complete admission and discharge record for every patient.

SECTION II.—48-hour cases.—The total number of cases of persons entirely incapacitated from duty for periods of 48 hours or less, whether admitted to sick quarters or not, together with the number of days’ sickness involved, will be entered in section II. This will not include cases transferred to hospital within that period, nor will it include personnel excused duty for 48 hours or less on account of prophylactic inoculation.

SECTION III.—Unit strength.—The numerical strength, on the day of compiling the form, of each unit to which the form refers will be entered separately in this section. (See clause 2 (a).)

SECTION IV.—Bed state, will show the number of patients remaining from the previous week and also the numbers of new admissions, discharges, transfers and deaths.

SECTION V.—Beds equipped, similarly will show the number of equipped beds in the hospital or sick quarters.

5. Procedure at the end of each year.—(a) All cases remaining in sick quarters or hospitals on 31st December will be regarded as nominally discharged on that date and re-admitted on

1st January. These nominal discharges will not, however, be shown in section IV ; only actual discharges will be recorded in this section.

(b) When the 31st December does not fall on a Friday, the Form 38 due to be compiled on the last Friday of the year will be extended to include all cases admitted up to midnight of 31st December. Similarly, the first Form 38 rendered in the new year will include the period, if any, subsequent to 31st December and additional to the first complete week of the new year. Section I of the latter form will be divided into two distinct parts :—

(i) Cases remaining from 31st December and re-admitted in accordance with clause 5 (a). The original serial number prefaced by the letter " R " to indicate " remaining " will be entered, but the date of admission will be recorded as 1st January.

(ii) Entirely new admissions since the 1st January.

6. *Personnel of other services*.—Separate Forms 38, when called for by the Air Ministry, will be compiled weekly for personnel of—

(a) the Royal Navy and Royal Marines,

(b) the British Army,

(c) the Indian Army, and

(d) Dominion forces,

admitted to R.A.F. hospitals or sick quarters during the week. These forms will be marked prominently (e.g. " British Army Personnel "), and on completion will be forwarded to the competent medical authority for disposal, unless other instructions are issued by the Air Ministry.

256. Forms 39 and 41.—Hospital or Sick List Record.—Consultant's or Special Reports.—For the general description and disposal of the forms *see* para. 250, clause 2.

1. (a) *General*.—Form 39 consists of a card and flimsy and is completed from the relevant Form 41 when a patient is discharged from hospital or sick quarters after 48 or more hours treatment. Form 41, which is used as a case sheet, will be completed for every case admitted, and retained as a permanent record at the sick quarters or hospital rendering the form. Continuation sheets are available for both these forms.

(b) *Personnel treated in sick quarters other than their own*.—In the case of personnel treated for more than 48 hours in sick quarters other than their own, Form 39 will be rendered by the medical officer of the parent unit on receipt of the relevant Form 41 from the sick quarters where the patient was treated, except in respect of overseas personnel sick while on leave in the United Kingdom as provided in para. 255, clause 3 (d) (iv).

2. *Continuity of treatment.*—When personnel are re-admitted to the same hospital or sick quarters for further treatment on account of a disability for which they were previously discharged, new Forms 41 and 39 will be initiated and headed "Continuity of Treatment" except in cases of relapse as provided in para. 255, clause 4 (b).

3. *Transfers to civil hospitals.*—When a patient is transferred from a service hospital or sick quarters to a civil hospital, a new Form 41, giving details of "previous history of case" and "present condition of the patient" will be prepared and sent to the hospital with a covering letter asking that any further clinical notes made at the hospital be entered on the form, and that the form be sent to the unit to which the patient is eventually discharged. To avoid errors an addressed envelope, for reply, should be enclosed. On return to the unit Form 41 will be completed by the medical officer and a Form 39 rendered.

4. (a) *Personnel sick on leave.*—Forms 39 for officers and airmen sick on leave will be headed "Sick on leave" and will be rendered by the medical officer of the parent unit as soon as particulars are available. One form is required to cover the period of treatment at home and, if the case is transferred to a hospital (service or civil), to effect the transfer. A second form will be prepared to cover the period in hospital, and a third form, when applicable, for any period of treatment at the station subsequent to discharge from hospital, providing that the officer or airman is unfit for any form of duty.

(b) *Personnel sick while on leave from abroad.*—The S.M.O. of No. 1 R.A.F. Depot, Uxbridge, will be responsible for personnel who are sick while on leave in the United Kingdom from commands abroad and still on the strength of a command abroad. Forms 39 for these cases will be headed "Sick on leave from abroad" and both card and flimsy forwarded to the competent medical authority of Training Command for transmission to the Air Ministry.

5. (a) *Patients awaiting transfer to the United Kingdom on medical grounds.*—When patients are transferred to the United Kingdom, a Form 39 will be prepared to cover any period which may elapse between the date of the medical board and the date of embarkation, when such cases are discharged to their unit on "excused duty" awaiting embarkation. The date of embarkation will always be stated.

(b) *Medical documents for patients transferred from abroad and embarked in packet vessels and freightships.*—The competent medical authority abroad responsible for embarkation will

ensure that a brief summary on Form 41 of the history, progress and treatment of the case is handed to the ship's surgeon at the time the patient is embarked. The ship's surgeon will be requested in writing, to add on the Form 41 clinical notes during the voyage, and to hand it to the R.A.F. Embarkation Officer at the time the patient is disembarked. The embarkation officer will transmit these forms to the C.O. of the unit or hospital to which the patient is travelling.

This procedure is applicable to officers, members of P.M.R.A.F. Nursing Service, airmen, civilian officials and employees and also to families who may require treatment at public expense. In the case of families not being admitted to a service hospital the embarkation officer will be requested to transmit the documents to the Air Ministry.

6. *Airmen of unsound mind.*—Form 39 (flimsy) for an airman of unsound mind to be transferred to Netley Hospital, will be inserted into Form 48 which will be despatched so as to reach that hospital two clear days before the transfer takes place. The number of days in hospital shown on the form will include the whole period to the actual date of transfer of the patient. Form 39 (card) will be disposed of as directed in para. 250, clause 2 (b) (see paras. 150, clauses 2 (a) and 4, and 300).

7. *Personnel transferred to the Reserve while in hospital.*—When officers and airmen, who are patients in hospital, are transferred to the Reserve prior to their discharge from the hospital, Form 39 will be prepared up to and including the date of such transfer. A further Form 39 will be prepared for the period for which further treatment is afforded, headed "Transferred to the Reserve" and disposed of in accordance with para. 250, clause 2 (b).

8. *Patients invalided from the service.*—In order to complete medical records, the president of a medical board on an airman will extract from Form 496 on to a separate Form 39:—

- (a) the diagnosis of any disability discovered, and
- (b) recommendations of the Board.

This Form 39 will be dated and signed by the president and disposed of in accordance with para. 250, clause 2 (b). When medical boards are held in other than R.A.F. medical establishments, the competent medical authority of the command will make the necessary certified extracts on to Form 39.

9. *Forms 39 from Royal Naval and Army medical establishments.*—All Forms 39 (cards) from naval and military medical establishments in the United Kingdom will be collected by the Officer i/c Medical Statistical Office, Ruislip. Abroad they will be forwarded to the R.A.F. competent medical authority of the command to which the personnel belong.

10. *Radiographers*.—With regard to the recording of blood examinations of radiographers, *see* para. 445.

11. *Civilians*.—In the case of women, children and other civilians admitted to R.A.F. hospitals, and women and children treated for more than 48 hours in sick quarters specially authorised by the Air Ministry to treat such patients, Form 39 (card only) will be completed and forwarded to the competent medical authority concerned to enable Form 38 to be compiled. It will be retained by him, except in cases of outstanding professional interest and in cases of death or injury, when it will be transmitted to the Air Ministry. In the case of patients treated in hospitals and sick quarters other than their own, Form 39 will be forwarded direct to the station medical officer concerned for his information as to past, and recommendation as to any further treatment. In no circumstances will the flimsy copy of Form 39 for families be included in an officer's or airman's Form 48.

12. *Record of opinions of consultants*.—In recording these the following procedure will be adopted :—

(a) *In-patients*.—

(i) The consultant will record and sign his opinion on the relevant Form 41 for a patient in hospital or sick quarters seen at the medical establishment where the patient is undergoing treatment.

(ii) When a patient is seen by a consultant elsewhere, the medical officer requesting the consultation will forward the current Form 41, together with a Form 41 completed in respect of particulars of the patient, and Form 48 in the case of serving personnel, to reach the unit concerned at least 24 hours before the time appointed for the consultation. The consultant will record and sign his opinion on the original Form 41 and return it to the unit concerned. The duplicate Form 41 will be retained for record purposes at the unit where the patient has attended.

(b) *Out-patients*.—

(i) *General*.—The medical officer who is applying for the opinion of the consultant will complete Form 41 in duplicate up to and including the "present condition of the case", attach it to Form 48 in the case of serving personnel, and forward it to reach the appropriate medical unit at least 24 hours before the patient is due for consultation. The C.O. or S.M.O. of the medical unit where the consultation is held will be responsible, after the

consultant has recorded his opinion on the Form 41, for returning one copy, together with the Form 48, to the unit concerned. The other copy will be retained as an office record. In order that the medical officer of the unit may be aware as early as possible of the consultant's opinion as regards the patient's condition and any treatment he may recommend, the forms will be returned by hand and under sealed cover on the day of the consultation. On receipt, the medical officer will be responsible for transferring a certified true copy of the consultant's opinion from Form 41 to Form 39, headed "Consultant's Report", which will then be disposed of in the usual manner.

(ii) *Neurological*.—Officer patients referred to the Consultant in Neurology as out-patients will attend the C.M.E. by appointment and not one of the R.A.F. hospitals on the consultant's visiting day unless the latter procedure is more convenient.

(c) *Patients likely to be invalided*.—When a consultant reports on a case which is likely to be brought before an invaliding board, he will not express an opinion as to attributability or aggravation thereby, or of the percentage of the disability on Form 39, but on a special pro forma which will be retained as a confidential document by the Commanding Officer for the information of the medical board. In no circumstances will the patient concerned be allowed to have access to the form.

13. *Compilation*.—(a) *Diagnosis*.—Diagnosis will be in accordance with the "Nomenclature of Diseases". In the event of an alteration, the disease or injury previously entered will be ruled through in such a way as to remain legible and the new diagnosis entered above. Any new disease supervening will be entered under the appropriate heading with the date of diagnosis.

(b) *Particulars*.—Attention will be given to ensuring that all particulars are inserted and that the official number is correct.

(c) *Number of days under treatment—method of recording*.—

(i) *At sick quarters*.—When a patient is transferred from sick quarters to hospital, the day on which the transfer is made will not be counted.

(ii) When a patient is discharged from sick quarters to duty, each period of 24 hours spent in sick quarters will be counted as one day. Periods of less than twelve hours in excess will not be counted.

(iii) *At a R.A.F. hospital.*—When a patient is received from a station into a hospital at the same station, days of sickness in hospital will be counted as in (ii) above.

(iv) When a patient is received into a hospital which is not situated at his station, the days of admission and discharge will be counted, if he is discharged to duty. If he is transferred to another hospital, the day on which the transfer takes place will not be counted.

(d) *Sick leave.*—When a patient is discharged to sick leave the period of sick leave will be stated.

(e) *Operation cases.*—In all operation cases when an anaesthetic is used, its method of administration will be entered in the space provided. (See para. 213 with regard to permission to administer anaesthetics.)

(f) *Tuberculosis.*—Every case admitted to hospital or sick quarters for a disability which is a possible forerunner of tuberculosis will be subjected, before discharge to duty, to a clinical examination specially directed towards the detection of tuberculosis. The result of this examination will be briefly recorded on the relative Form 39, and if there should be reason to suspect that the present illness may be tubercular in nature, a note to this effect will be added.

(g) Where tuberculosis is diagnosed, brief particulars of any debilitating illness, unusual stress or exposure, or other circumstance that is likely to be the attributable cause of onset, will be given.

(h) *Injury.*—In cases of injury, the date together with a short statement of the cause and whether sustained—

- (i) on duty,
- (ii) off duty,
- (iii) in an organized game, or
- (iv) on leave,

will be recorded under "Previous history of the case". In cases of disease, any relevant factors, such as the nature of any special duty on which the patient was employed, will be entered under this heading as this information may be useful later in deciding any claims to disability pension in the event of invaliding.

(i) *Inoculation and vaccination.*—In cases of disease for which prophylactic inoculation or vaccination is practised, e.g., the enteric group, diphtheria, scarlet fever, cholera, plague and smallpox, the dosage and dates of the relevant inoculation or vaccination will be recorded. Where no inoculation or vaccination has been carried out, a note to this effect will be made.

(j) *Personnel of the Royal Navy, Royal Marines and Army.*—Form 39 (Army Form I 1220—card only) will be compiled for each case admitted to R.A.F. hospitals or transferred to another hospital, but not for cases treated in barracks or in R.A.F. sick quarters, except in cases of death or cases of outstanding professional interest. In commands where the medical charge is a R.A.F. responsibility, a card will also be compiled for each officer or soldier dying out of hospital. The cards of all patients who have been disposed of by :—

- (i) Discharge to duty,
- (ii) Discharge as an invalid,
- (iii) Death, or
- (iv) Transfer to another hospital,

will be forwarded weekly to the competent medical authority who will dispose of them as instructed by the Air Ministry.

(k) *Death.*—In case of death, the findings of the autopsy, if held, will be recorded, and the competent medical authority concerned will state his opinion on Form 39 (card) as to whether or not death was the result of wound, injury or disease attributable to service or aggravated thereby, and if so, by what special conditions of service.

(l) *End of year.*—Cases remaining in medical establishments on the 31st December, will be nominally discharged and re-admitted on the 1st January. The Form 39 dealing with the period of sickness up to 31st December will show the words "Remaining on 31/12/.." under the heading "Date of discharge to duty", and the "Number of days under treatment" line will show the number of days to the 31st December only. A second form will be compiled for the remaining period of the disability in the next year. The original serial number will be retained but will be prefaced by the letter "R" indicating "remaining". The "Date of admission" line will read "Re-admitted 1/1/.." and only the actual number of days from the 1st January will be recorded on the "Number of days under treatment" line. Form 39 (card and flimsy) will be marked prominently at the top "Remaining from 31/12/.." Only one Form 41 need be prepared.

(m) *Beginning of year.*—On the first of January in each year, a new Form 39 (Army Form I 1220) with the old serial number will be made out for each patient who remained in hospital on the previous day, the words "Remaining on 31/12/.." being written on the top of the new card. The old cards will be disposed of as detailed above, the words "Remaining on 31/12/.." being written on the top of each card.

257. Forms 42 and 43. Special Medical Examination Record.—For the general description and disposal of the form see para. 250. These forms will be rendered for the following medical examinations :—

1. *Annual medical examinations.*—(a) All officers (including officers of the Auxiliary Air Force), cadets, members of P.M. R.A.F. Nursing Service, airman pilots (including airmen undergoing flying training with a view to qualifying as airman pilots), pilots of the Reserve (while undergoing annual training), volunteer reservists, air gunners, and air observers, will be medically examined annually in accordance with K.R. & A.C.I., paras. 1097, 1428, 1443, clause 1 (a) and 1446, clause 2 (m).

(b) *Examination period.*—Except for air gunners and air observers (see clause 5 (c)) these examinations will be carried out between 1st May and 31st July in each year.

(c) *Classification of flying personnel.*—In the case of officers of the general duties branch (except those previously categorized as permanently unfit for combatant flying), and airman pilots qualified and undergoing flying training, Form 42 will be completed in detail, and the personnel will be classified up to the full extent of their fitness for flying duties irrespective of rank or age, or of their being employed on other than flying duties at the date of the examination.

(d) *Tests for non-flying personnel.*—In the examination of officers who are not qualified to wear the flying badge, or have been found permanently unfit, categories A.1, 2, or 3, and of members of P.M.R.A.F. Nursing Service, the following tests may be omitted :—

- (i) Pulse rate—standing.
- (ii) Pulse rate—after exercise.
- (iii) Pulse rate—time of return to normal.
- (iv) Self-balancing.
- (v) Endurance (40 millimeter test).
- (vi) Ocular muscle balance.
- (vii) Colour vision.
- (viii) Valsalva.

(e) *Special duty officers.*—The competent medical authority, Training Command, will arrange for the annual medical examination of all R.A.F. officers employed in the United Kingdom on the special duty list, with the exception of those detailed in (f) below. This examination will be arranged at

the nearest R.A.F. station to the place of duty. The completed Forms 42 (card), together with a nominal roll of officers not examined, will be transmitted to the Air Ministry as directed in para. 250, clause 2 (b). He will apply to Air Ministry for their Forms 48.

(f) *R.A.F. officers with R.N. Units.*—Arrangements for the annual medical examination of R.A.F. officers, borne on the strength of units administered by the Admiralty, will be made by the Air Ministry.

(g) *Avoidance of too frequent examination.*—In order to avoid too frequent medical examination, personnel who have been examined within a period of three months for any reason other than the annual medical examination, the result being available on a completed Form 42, need not be re-examined, provided that the medical officer is satisfied that there has been no deterioration in physical standard since the previous examination. In all cases, a second Form 42—annual medical examination—must be copied from the record of the recent examination, as these forms are required for statistical purposes.

(h) *Disposal by competent medical authority.*—Forms 42 (cards) will be forwarded to reach the Air Ministry not later than 1st October from commands at home and 1st November from commands overseas in each year. A nominal roll of all personnel who have not been examined, stating the reason for non-examination in each case, will accompany them.

2. *Warrant Officers on selection for permanent commissions.*—The preliminary examination will be carried out on Forms 42 and 43 in accordance with clause 1 (d) and the result inserted on the special proforma (see A.M.Os.).

3. *Airmen selected for training as pilots.*—(a) When an airman has been selected as suitable to be trained as a pilot, the medical officer will make a preliminary examination in accordance with K.R. & A.C.I., para. 506, clause 2 and 1446, clause 2 (h) using Form 42, to determine the airman's fitness to appear before a medical board. No further Form 42 will be necessary prior to the medical board unless the medical officer considers that the airman's condition has altered materially since the preliminary examination. The standard of medical fitness required will be "A 1 B" as defined in K.R. & A.C.I., para. 1434 (for detailed medical examination see A.P. 130). The medical officer will complete the certificate on the form of recommendation (Form 494) and the assessment of the examination will be recorded on Form 42 at "Medical classification indicated by this examination" as "fit" or "unfit for presentation to a medical board". (See para. 50.)

(b) An airman selected to undergo flying training will be examined (Forms 42 and 43 being used) if more than three months have elapsed since he was found fit to learn to fly by a medical board or if the medical officer of his unit considers that injury or sickness subsequent to his board may have affected his fitness for flying.

4. *Officers and airmen pilots loaned to Dominion, Colonial or Foreign Governments.*—(See paras. 68 and 83.)

5. *Medical examination of air gunners and air observers.*—

(a) *Standards.*—

(i) *General.*—The airman will be required to satisfy the standards laid down in A.P. 130 in all respects except that the minimum standard of visual acuity will be, without glasses, 6/6 in the better eye and not less than 6/9 in the other eye. Colour vision, which must be normal or "safe" (see A.P. 130, paras. 45 and 125), will be tested by means of Ishihara's plates or the Edridge Green lamp.

(ii) *Reference to a medical board.*—Where doubt exists regarding an airman's fitness, he may be referred, in home commands, to the Central Medical Establishment and in overseas commands, to the headquarters medical board who will record their opinion on a Form 46.

(b) *Classification.*—The medical officer will not classify the airman in accordance with the standards in K.R. & A.C.I., para. 1434, but will state whether he is "fit (or unfit) air gunner or air observer".

(c) *Annual medical examinations.*—

(i) *Examination period.*—Air gunners or air observers will be medically examined annually at such times, between 1st January and the last day of February, as are most convenient to commands, and also after any period of sickness likely to interfere with their flying efficiency.

(ii) *Reference to a medical board.*—Where an airman's fitness is in doubt he may be referred to a medical board as in clause (a) (ii) above.

(iii) *The tests for colour vision* will not be repeated at these examinations.

(d) *Disposal of Forms 42.*—Form 42 will be completed and disposed of in accordance with para. 250, clause 2 (b).

(e) *Responsibility for examination.*—The C.O. of a unit, on whose strength the air gunner or air observer is borne on the last day of February, is responsible for ensuring that he has been medically examined.

6. *Compilation.*—(a) These forms will be compiled in accordance with K.R. & A.C.I., paras. 1443 and 1446.

(b) *Abbreviations.*—In carrying out the examination, tests will be performed as laid down in A.P. 130, and only the standard abbreviations shown in that publication will be used.

(c) *Personnel on whom no previous Forms 46 or 826 have been completed.*—Care will be taken to ensure that the information recorded under the heading "Classification at, and date of last Medical Board" is correct :—

(i) In the case of an officer on whom a medical board has not been held, the entry under this heading will show the date of commission to the R.A.F. and the first medical classification after that date.

(ii) In the case of an airman on whom no medical board or medical examination on Form 42 has been carried out, the entry will record the date and medical classification at the last medical examination held, *e.g.* "Fit for general service."

(d) *In hospitals.*—Forms 42 and 43 will not be rendered for personnel who are patients in hospital.

258. Forms 46 and 47. Medical Board on Officers, Cadets, Members of P.M.R.A.F. Nursing Service, Airman Pilots, Air Gunners or Air Observers.—1. For the general description and disposal of the form *see* para. 250. These forms will be used for recording the results of medical boards on officers, cadets, members of P.M.R.A.F. Nursing Service, airman pilots (*see* paras. 48 and 63 *et seq.*), air gunners and air observers (*see* para. 257, clause 5).

2. *Copies of Forms 47* will be forwarded in accordance with K.R. & A.C.I., para. 1435.

3. *Compilation.*—In the proceedings of medical boards, on officers and airman pilots of the non-regular air services, an opinion will be expressed on the following additional points :—

(a) Whether further treatment is necessary, and, if so, what the nature of such treatment should be.

(b) Whether the officer or airman pilot is fit for his civil employment.

3. For general instructions as to medical boards *see* paras. 45 *et seq.* and K.R. & A.C.I., paras. 1434 and 1436.

259. Form 48. Medical History Envelope.—1. *Description.*—This form consists of a stout envelope on which are printed tables for recording its contents, dental inspections and treatment, inoculations and vaccinations, blood groups, and

the issue of surgical appliances and spectacles. One Form 48 is issued for each member of the Royal Air Force and accompanies that individual, except in time of war, throughout his or her period of service (*see* para. 340).

2. *Preparation.*—A Form 48 will be prepared at the Air Ministry for every officer or member of P.M.R.A.F. Nursing Service on first entry into the service, and by the Officer i/c Records for a recruit when his attestation has been finally approved. The envelope will be sent to the unit to which the individual is posted.

3. *Compilation.*—(a) *Responsibility.*—Responsibility for the correct compilation of medical history envelopes and their enclosures, and for the insertion of the latter in the envelopes, will, in all circumstances, rest with the medical officers concerned.

(b) *Forms to be enclosed.*—The following only will be enclosed in Form 48 :—

- (i) Flimsies of Forms 35, 39, 42, 46, 473 and 826.
- (ii) Forms 478, 522 and 1768 (or Army Form I.1240).
- (iii) Summary of medical history or medical boards prior to 1918, *i.e.* Army Form B.178.

(c) *Table of contents.*—

(i) The enclosures will be numbered consecutively in the space provided in order of date (the date of Forms 39 to be that of the discharge of the patient from hospital or sick quarters) and a corresponding entry will be made in the table of contents of the Form 48 in respect of each enclosure.

(ii) When a Form 48 is returned from a Royal Naval or Military hospital, the medical officer will be responsible that the appropriate number is inserted, if this has not already been done, on the flimsy received from the hospital, and that an entry is made in the table of contents.

(d) *Record of surgical appliances.*—The table headed “ Issue of surgical appliances and spectacles ” will be completed whenever such issues are made.

(e) *Tables recording vaccinations and inoculations.*—All inoculations and vaccinations will be entered in the tables headed “ inoculations ” and “ vaccinations ” respectively. When an officer or airman refuses to be vaccinated or inoculated the word “ refused ” will be entered in red ink in the appropriate column. The entry will be dated and signed by the officer or airman concerned (who will not be kept back from drafts for abroad on this account, if considered otherwise fit).

(f) *Dental charts*.—When completing the charts, the dental officer will make use of the following symbols:—

Decayed teeth (saveable)	O
Decayed teeth (unsaveable)	X
Fillings present	●
Missing teeth	—
Wisdom teeth (unerupted)	U
Dentures (stating service or private) ..	D $\frac{10}{7}$
Oral hygiene	good, fair or neglected.

(i) *Dental chart "A"*.—Dental chart "A" on Form 48 will only be used to record the condition of the teeth of R.A.F. personnel on entry into the service. When a new Form 48 is issued to personnel who entered the Service prior to 1936, dental chart "A" will be completed from the single chart on the old form. After it has been completed no further entries will be made on the chart itself. (This chart was not printed on Form 48 prior to 1936.)

(ii) *Dental Chart "B"*.—Dental Chart "B" will be kept up to date showing the dental state at the last dental examination.

(g) *Dental treatment table*.—

(i) *Charting at Inspections*.—At any inspection and charting by a dental officer, if no treatment is required, the word "fit" will be entered in the treatment column, and also when treatment is completed. All entries will be dated and signed by the dental officer making the entries.

(ii) *Daily record book*.—The table will be completed by a dental officer from his daily record book in respect of every officer or airman examined or treated by him. (See para. 284 with regard to dentures, and work done by civilian dental surgeons.)

(iii) *Symbols*.—The following are examples of abbreviated symbols used when entering details of treatment completed:—

Additions to dentures	D. add. | 4
Amalgam	Amal. | 6
Amalgam, copper	Amal. Cu. | 68
Amalgam and cement linings	Amal. C. | 45
Arsenic dressing	AS ₂ O ₃ | 4
Cement	Cem. 4 |
Dentures fitted	D. $\frac{654}{653} | \frac{35}{67}$

Dentures remodelled	D. remod.	$\frac{654}{653} \mid \frac{35}{67}$
Dentures repaired	D. rep.	$\frac{U}{L}$
Extractions	Ext.	$\overline{54} \mid$
Extractions (general anaesthetic)	Ext. Gen.	$\frac{42}{65} \mid \frac{78}{12}$
Extractions (local anaesthetic) ..	Ext. L.A.	$\overline{6} \mid$
Gum treatment	G.T.	
Root dressing	R.D.	$\overline{7}$
Root filling	R.F.	$\overline{6}$
Scaling	Scl.	
Synthetic	Syn.	$\overline{21} \mid$

(iv) *Dressing*.—A record will not be made regarding an ordinary dressing unless such dressing is a final one, *i.e.* previous to posting of the person concerned.

(v) *Personnel under treatment, posted*.—If an officer or airman is posted from the station before treatment is complete, the word "incomplete" will be entered in the "treatment column".

(vi) *Refusal of treatment*.—When an officer or airman refuses dental treatment, the word "refused" will be entered in red ink in the "treatment" column, and the entry will be signed and dated by the officer or airman who has refused treatment.

(h) *Blood group*.—A record of the blood group of blood donors will be entered in the table headed "Blood Group".

4. *Custody*.—(a) *Responsibility*.—

(i) At non-medical units responsibility for the safe custody and transmission of medical history envelopes will rest with the C.O. of a unit. The forms, however, will be held at the station sick quarters by the medical officer of the unit or station, who will be responsible to the C.O. (to whom he will give a receipt on Form 591 or otherwise) for their safe custody while in his possession.

(ii) *Where there is no whole-time medical officer*.—At a station where there is no R.A.F. medical officer, Forms 48 will be kept by the C.O.

(iii) *At medical units*.—At a medical unit all Forms 48 for the staff (including those for members of P.M.R.A.F. Nursing Service) will be held by the adjutant.

(b) *Storage*.—They will be stored in a locked cabinet, arranged alphabetically, the envelopes for each unit being kept apart.

(c) *Care*.—A medical history envelope (with its enclosures) is a confidential document and will be handled and transmitted as such. An individual will not in any circumstances be allowed access to the contents of his or her own envelope and whenever it is required to be delivered by hand it will be placed under sealed cover.

(d) *Register*.—A book record (Form 1985) of all Forms 48 will be kept, and all receipts and despatches, showing the address from which or to which an envelope has been received or sent respectively, will be recorded with the date of the movement.

5. *Disposal*.—(a) An officer's Form 48 will be disposed of in accordance with K.R. & A.C.I., para. 2336.

(b) The disposal of Forms 48 for members of P.M.R.A.F. Nursing Service is the same as for officers (*see* A.P. 1075, para. 103).

(c) An airman's Form 48 will be disposed of in accordance with K.R. & A.C.I., para. 2170.

(d) For the disposal of Forms 48 for R.N. and R.M. pilots of the Fleet Air Arm *see* K.R. & A.C.I., para. 2336 and A.M.O. A.47/37.

(e) Whenever a medical board is arranged, the relevant Form 48 will be despatched so as to reach the president 48 hours before the time fixed for the board.

6. *Renewal*.—(a) *Fair wear and tear and loss of*—(*see* K.R. & A.C.I., para. 2172).

(b) *Unserviceable*.—When no longer serviceable owing to lack of space for further entries, the same procedure as in the case of fair wear and tear will be adopted, except that in the case of officers and members of P.M.R.A.F. Nursing Service the old form will be forwarded to the Air Ministry instead of being destroyed locally. In the case of airmen it will be forwarded to the Officer i/c Records for inclusion in the airman's documents. All enclosures will be transferred to the new form. The entries in the tables dealing with "Surgical appliances and spectacles", "Dental treatment", "Vaccination" and "Blood Group" will be transcribed in full, but for the remaining table (inoculation record) the first entry will be the last preventive inoculation for each type of disease shown in the corresponding table of the old form. The dental charts will be copied in detail on to the new form.

7. *Missing enclosures*.—If any enclosure is missing, application for replacement will be made to the competent medical authority of the command, who will refer the matter to the Air Ministry.

8. *When further action is required.*—In order that the attention of all concerned may be drawn to any further action which is required in connection with the case of any individual officer or airman, an "Action Here" slip is to be firmly attached to the outside of the relevant Form 48 by the medical officer who initiates such action. The circumstances under which the slip is to be attached include those cases placed under observation for tuberculosis, those where Consultants' recommendations are to be carried out, etc. The necessary supply of "Action Here" slips will be demanded on the unit stationery indent under number "Code 13-6-0."

260. Form 58.—Report on Findings of Medical Board or Special Medical Examination.—This form is used for communicating the findings of medical boards, completed on Forms 826, or special medical examinations (C.A. Form 36) on "B" licence holders who are also Reservists, to the Air Ministry. (See para. 48.) One copy is forwarded and one retained as an office record. Copies will be distributed as follows:—

- | | |
|---|---|
| 1. Candidates accepted for flying duties. | { The Air Ministry.
Superintendent of
R.A.F. Reserve
and Inspector of
Civil Flying Train-
ing Schools. |
| 2. Officers of the non-flying branches | |
| 3. Applicants accepted for the medical branch and P.M.R.A.F. Nursing Service. | |
| 4. Officer candidates accepted for the Auxiliary Air Force. | { The Air Ministry.
The Air Ministry.
The appropriate Group. |
| 5. Naval officers, applicants for service in the Fleet Air Arm. | { The Air Ministry.
The Admiralty. |
| 6. Army officers seconded to the Royal Air Force. | { The Air Ministry
(two copies). |
| 7. Airmen accepted for training as air-
men pilots. | { The Air Ministry
(two copies).
Superintendent of
R.A.F. Reserve
and Inspector of
Civil Flying Train-
ing Schools (one
copy).
Superintendent of
R.A.F. Reserve
and Inspector of
Civil Flying Train-
ing Schools. |
| 8. "B" licence holders who are Re-
servists. | |

- | | | |
|---|---|--|
| <p>9. "B" licence holders who are Reservists, on change of category (not applicable to the control of medical establishment.)</p> | } | <p>The Air Ministry.
Superintendent of
R.A.F. Reserve
and Inspector of
Civil Flying Training
Schools.
Records (when
class "E" or "F"
Reservists)</p> |
| <p>10. Volunteer Reserve</p> | } | <p>Superintendent of
R.A.F. Reserve
and Inspector of
Civil Flying Training
Schools.
Records.
Commandant of
Town Centre.</p> |

261. Form 62.—Medical Examination of Recruits, Apprentices and Boy Entrants—Interrogatory Form.—This form will be completed and signed by every recruit in the presence of the examining medical officer, who will also sign it at the time of the medical examination. In the case of apprentices or boy entrants it is signed by the parent, guardian or family doctor. On completion the form will accompany the entrant's other documents to No. 1 R.A.F. Dépôt, and, after attestation, it will be forwarded to the Officer i/c Records for filing with the appropriate attestation paper.

262. Form 64.—Airman's Service and Pay Book.—This form is a pocket book with a stiff waterproof cover and will be carried by every airman on active service. It will contain, with other details of the airman's service, the only record available in the field of his medical category, vaccination and inoculation state, blood group, and prescription for spectacles. (See A.P.1301.)

263. Form 155.—Embarkation of Families.—Medical Certificate.—This form is used to record the medical examination of families prior to embarkation, their vaccination and inoculation state, and their freedom from infection immediately prior to embarkation. On it is included a list of service stations where vaccination and inoculation can be performed. The form is also used as a claim for fees by civilian medical practitioners carrying out the examinations. It will be completed in duplicate by either a service medical officer or a civilian medical practitioner. It will be brought by the family concerned in duplicate to the port of embarkation, and handed to the embarkation officer. One copy of the form will

be retained by the embarkation medical officer for reference purposes, and the other sent by him, or by the S.M.O. if the forms are handed over to him by the embarkation medical officer, to the competent medical authority of the command to which the family is proceeding.

264. Form 166.—General Directions to Consumptive Persons.

—A copy of this form will be issued to each pulmonary tuberculosis patient as soon as he is so diagnosed.

265. Form 182.—Trade Test Card of Airmen of Medical and Dental Branches.—This consists of a card and two flimsies and constitutes the application for and notification of results of medical and dental trade tests. It will be passed directly from the unit to the training officer (medical) and its employment is dealt with in K.R. & A.C.I., Chapter X, Section II.

266. Form 241.—Weekly Summary of Sickness in Commands.

1. *General.*—This form will be completed weekly by competent medical authorities and forwarded to the Air Ministry. The form will be prepared from Forms 38. It is divided into three tables.

2. **TABLE 1.—Non-effective sick, flying casualties and deaths.**—This will give the total number of "non-effective, sick" remaining on the last day of the period. On it a note will be made of flying casualties, aircrew accidents and deaths occurring during the period.

3. **TABLE 2.—Strengths of units and number of non-effective sick.**—This will show the average strength by stations of the command or independent group for the period, and give details under certain specified headings of the number of fresh cases of non-effective sick occurring during the period. "Continuity of treatment" admissions will not be included in this table. The names of all flying casualties and deaths will be inserted.

4. **TABLE 3.—Notifiable diseases.**—This will record the number of notifiable diseases, by stations, occurring during the period of the return. The name of each case will be inserted.

5. *British army personnel.*—In commands where the medical charge of British Army personnel is the responsibility of the Royal Air Force, the competent medical authority will cause a separate Form 241 to be compiled monthly in triplicate for all army personnel admitted to R.A.F. hospitals or sick quarters during the month. One copy will be forwarded by the competent medical authority to The Under Secretary of State, The War Office, Whitehall, S.W.1, and the second copy to Air Ministry.

6. *Amendments.*—Any amendments to Forms 241 already rendered will not be entered in subsequent Forms 241 but submitted to Air Ministry by letter.

7. *Air Ministry Monthly Health Report.*—The Air Ministry Monthly Health Report for the Royal Air Force is compiled from the Forms 241 rendered by each command.

267. **Form 336.—Vaccination and Inoculation Return.**—A return of all vaccinations and inoculations will be rendered in duplicate on Form 336 in respect of the year ended 31st December, by the medical officer of a station to the competent medical authority, who will forward one copy to the Air Ministry not later than the 14th January following. Returns from commands abroad will be despatched as early as possible after the end of the year to which they relate.

268. **Form 345.—Orders for Patients in Hospitals.**—Orders for patients in hospitals will be posted in every ward and dining hall, and also in the pack and linen stores.

269. **Form 373.—Officer's Record Card.**—1. At every unit headquarters (*e.g.* station or command) a Form 373 recording medical category and vaccination and inoculation state, is held for each officer serving in that unit. In addition, at each group headquarters at home or command headquarters abroad copies are held of Forms 373 for all officers serving in stations or units under that command.

2. *Responsibility of medical officer.*—(a) The officer in medical charge of a unit, whether it be a squadron, station or command headquarters, is responsible that full details are supplied so that entries can be kept up to date on these forms. These details will be inserted only on Forms 373 held at the units in which the officers are serving, and not on the duplicate copies held at group or command headquarters.

(b) The above instructions apply not only to officers of the regular air force on the peace establishment of the unit, but also to all officers joining on mobilization.

3. *In a theatre of war.*—(a) Form 373 is held by the Base Personnel Staff Officer and will be the only record available showing the medical category and vaccination and inoculation state of an officer.

(b) When an officer is posted to a unit, the Base Personnel Staff Officer will give the Commanding Officer of the unit an extract from the Form 373 of that officer so that the medical officer may have available details as to medical category, vaccination and inoculation.

(c) When an officer is medically examined, vaccinated or inoculated, the necessary details will be given by the medical

officer to the Commanding Officer of the unit for the information of the Base Personnel Staff Officer in order that Forms 373 may be kept up to date. (See A.P. 1301.)

270. Form 415.—Certificate of Issue of Surgical Appliances.—This form is used whenever appliances other than spectacles (*e.g.* trusses, abdominal belts, suspensory bandages, etc.) are issued to personnel of a unit. On the date on which an issue is made, it will be completed in full in all columns and retained to support the medical account. (See para. 374, clause 3 (c).)

271. Form 418.—Notification of Infectious Diseases.—Two copies will be sent to the competent medical authority (one for forwarding to Air Ministry), and if the disease is in category (a) (*see* para. 617) one to the local Medical Officer of Health. One copy will be kept as a station record. Every copy will show *all* the addressees to whom the notification is made (the use of carbon paper will ensure this). In the event of a change of diagnosis (whether due to previous error or new disease) a new notification will be made, the form being headed in red ink "Change of diagnosis".

272. Form 460.—Notification of Tuberculosis to the Medical Officer of Health.—1. When an airman is discharged from the R.A.F. on account of tuberculosis, Form 460 will be prepared in triplicate by the Officer Commanding the hospital, one copy being forwarded to the Officer i/c Records with the ex-airman's documents, and the remaining copies to the medical officer of health of the airman's selected place of residence, as indicated on the form.

273. Forms 473 and 474.—Routine Pathological Overhaul.—For the general description and disposal of the forms *see* para. 250. These forms will be compiled by the pathologist carrying out a routine pathological overhaul. Form 474 will act as the record for the unit at which the pathological overhaul is performed.

274. Form 478.—Venereal Disease Case Card.—1. This is a buff coloured book. It will be initiated for every case of venereal disease by the hospital or sick quarters in which the case first receives treatment. It will be inserted in Form 48, given an enclosure number, and kept in the envelope until the completion of treatment and period of observation. The necessary entries on the form will be made in accordance with the instructions thereon.

2. *Out-patient treatment.*—When a patient is attending for out-patient venereal treatment, Form 48 will be retained at the sick quarters of his unit, but he will take Form 478 with him under sealed cover; this form will be returned with him in a similar manner.

3. *Patients embarked on transports.*—Forms 478 of venereal cases embarked while still under treatment will be enclosed in Forms 48 and sent to the S.M.O. of the ship who, at the end of the voyage, will transmit them to the C.O. of the unit or hospital to which the personnel are proceeding.

4. *Relapse or re-infection.*—(a) If a patient, discharged from hospital for treatment as an out-patient, is re-admitted on account of a recurrence or re-infection of his disease during the period of observation, the word "Relapsed" or "Re-infected" (with date) will be entered in red ink on his Form 478, page 1, line 10. In the case of re-infection, the particulars required on page 12 will be entered alongside those given for the original infection.

(b) When a Form 478 has been returned to Air Ministry and it is required once more in order to record further treatment, application will be made through the competent medical authority to the Air Ministry.

5. *On completion of treatment.*—On completion of treatment and the appropriate period of observation, an entry to this effect will be made, and the form will be forwarded under confidential cover through the usual channels to the Air Ministry. The enclosure number in Form 48 will be deleted in red ink, and the date of forwarding to the Air Ministry inserted opposite the deletion.

6. *A register of all cases of venereal disease* will be kept by competent medical authorities. S.O. Book 129 is suitable for this purpose.

275. Form 496A.—Medical Board on an Airman Suffering from Tuberculosis.—This is a special report form to be completed by the medical board whenever an airman suffering from pulmonary tuberculosis is invalided from the Service. It will be attached to and accompany the Form 496.

277. Form 522.—Weight Record Card.—1. Every officer and airman will have his weight recorded on Form 522 on the following occasions :—

- (a) On detention in station sick quarters.
- (b) On admission to hospital.
- (c) On reporting to his unit after sickness on leave.
- (d) On such other occasions as the medical officer may desire.

2. In addition each recruit, apprentice and boy entrant will have his weight and height recorded between the fourth and sixth month of his training, the height being entered in the fourth column of the card.

3. The weight, in stones and pounds, to the nearest pound, will be recorded immediately after weighing, unless it has been so recorded within the previous three months. The weighing of the subject, stripped, will take place under the direct supervision of the medical officer, who, on noting any progressive loss of weight, will take action accordingly. Form 522 will be kept in Form 48 as enclosure "IA".

4. Scales will be tested in accordance with K.R. & A.C.I., para. 2430.

278. Form 591 (for use in the United Kingdom) and Form 591A (for use Abroad).—Receipt for Documents.—This form will be used on all occasions when documents are dispatched from a sick quarters or unit to another unit. The originator will give the form a serial number and keep a record of its dispatch, and on receipt it will be signed by the addressee and returned to the originator. (See para. 259, clause 4 (a) with regard to Form 48.)

279. Form 594.—Discrepancy Report.—This form will be prepared in triplicate when any discrepancy between the quantity or condition of medical and dental equipment as supplied and as shown on a voucher is noted, and two copies will be forwarded to the competent medical authority with the relevant Form 600 or 712A. The third copy will be retained as an office record.

280. Form 600.—Demand, Issue and Receipt Voucher.—
1. This form will be used as an Issue or Receipt Voucher when it is required to issue equipment off charge from a medical account (e.g. returns to a medical stores depot or issues to a neighbouring unit—see para. 385). It is prepared in quadruplicate, the serial number of the voucher (issue or receipt) and details of consignor and consignee being inserted in the appropriate spaces.

2. To vouch an issue:—

(a) *The first copy (black)* may be used as a packing note when issuing equipment to the medical stores depot or to another unit, and sent in the same package as the equipment. The contents of each case or package will be shown on separate vouchers, as each packing note must give a correct list of the equipment contained within the particular package. The only columns requiring completion are "Description", "Denomination of Quantity" and "Quantity supplied". The voucher will be completed by the signature, at the right-hand bottom corner, of the officer issuing the equipment.

(b) *The second copy (blue) and third copy (red)* will be sent by post to the competent medical authority for transmission to the consignee. The latter will check them, and fill his own

receipt voucher number in the top left-hand corner. For conditioning purposes (carried out by Boards of Survey only) the columns headed "S", "R", "U/C" and "U" (indicating "serviceable", "repairable", "unclassified" and "deficient" respectively) will be used. (See A.P. 830, Vol. I, Chapter 38, para. 40.) The "unpacked and checked by" section will be completed and the forms signed on the "officer receiving equipment" line. The red form will be retained as a supporting voucher for the account and the blue form returned through the competent medical authority (for Form 670 action if necessary) to the issuing officer, who will cross-refer it with the fourth copy (see (c) below) and retain both to support the issue off his account. Form 594 will be completed for any breakages or deficiencies (see para. 279).

(c) *The fourth copy (black).*—The issue will be recorded in the ledger from the fourth unperforated copy of Form 600 with which the receipted blue copy will be compared and cross-referred on return from the consignee. (See paras. 279, 370, 371, 385 to 388, 393, 395 and 400.)

281. Form 605.—Stores Inward Book.—This ledger will be used in medical units for recording the receipt of all medical and dental equipment and items of diet.

282.—Form 624.—Sick or Medical Inspection Report.—

1. *Action by orderly N.C.O.*—When an airman reports sick he will invariably be accompanied by Form 624 in duplicate, completed, in regard to his particulars, by the orderly N.C.O. For an airman reporting sick at other times than sick parade, the form will be marked in red ink at the top "Special".

2. *Action by medical officer.*—The medical officer will insert the diagnosis and how each case is disposed of, *i.e.* "Medicine and Duty", "Light Duty", "Detained" (*i.e.* appears to require treatment for less than 48 hours), and "Hospital" (stating the name of the hospital). When an airman reports sick unnecessarily, the word "Duty" in red ink only will be entered on the sick report against his name.

3. *Officers reporting sick.*—When an officer reports sick he will take with him a Form 624 in duplicate signed by the adjutant (or his deputy) of his unit. In completing the form the medical officer will state the probable period during which the officer will be non-effective so as to enable the C.O. to comply with K.R. & A.C.I., para. 339, clause 2.

4. *Disposal.*—One copy of the Form 624 will be passed to the C.O. of the unit concerned, and the duplicate copy will be retained at the sick quarters.

5. *Patients sent to hospital from a sick quarters.*—When a patient requiring hospital treatment is sent to a service

hospital, the medical officer will forward Form 624 in duplicate to the hospital, where it will be completed and the duplicate copy returned.

6. *Admission to a R.A.F. hospital.*—The orderly medical officer will examine all patients sent to hospital as soon as possible after arrival and allot them to wards. He will complete the two Forms 624 brought with the patient, showing whether the patient is "detained" (this only applies to patients from a station in which the hospital is situated) or "admitted". (See K.R. & A.C.I., para. 1604, clause 4.) One copy of the form will be returned to the unit and the other retained as an office record.

7. *Transfer from one hospital to another.*—When a patient is transferred from one hospital to another, Form 624 in duplicate will accompany him. The orderly medical officer of the new hospital will complete the Forms 624, return one copy to the hospital transferring the patient and retain the other as an office record. The C.O. of the transferring hospital will be responsible for informing the patient's unit of the transfer.

8. *Discharge from hospital.*—When an officer or airman is to be discharged from hospital, the C.O. or his deputy will complete the reverse of Form 624, showing the individual's disposal, and despatch it to his unit 24 hours before he is due to leave the hospital.

283. Form 624A.—Sick or Medical Inspection Report.—This is printed on both sides, the same as on the front of Form 624. It is of foolscap size and used for sick parades at large units.

284. Form 632.—Dental Report. Supply or Repair of Dentures and Civilian Dental Surgeon's Estimate.—1. *Procedure by R.A.F. Dental Officers.*—(a) *Recommendation of supply or repair.*—Form 632 (front page) will be used by dental officers when recommending the supply or repair of dentures for personnel entitled thereto in accordance with K.R. & A.C.I., para. 1564 or 1566 and A.M.O. A.320/35.

(b) *Approval.*—The form, when duly filled in, will be submitted for approval in duplicate to the Inspecting Dental Officer, Uxbridge, in the United Kingdom, or the competent medical authority abroad, and no work will be undertaken until this approval has been obtained. The approving authority will return both forms to the Dental Officer, completed in section 3.

(c) *Disposal of models and impressions.*—When the supply of a denture has been approved, the dental officer will complete section 4 and forward one copy of the form, together with the models or impressions, to the Officer i/c Dental Mechanical Laboratory, Uxbridge, at home, or to the appropriate

laboratory abroad. This form (enclosed in an envelope) will accompany the models or impressions in all subsequent transmissions between the dental officer and the Officer i/c Dental Mechanical Laboratory.

(d) *Receipt for dentures from patient.*—When the denture has been satisfactorily fitted, the dental officer will obtain the patient's signature in section 5, complete section 6 on both copies, and return the copy of the form, which accompanied the denture, to the Officer i/c Dental Mechanical Laboratory for retention; the other copy will be forwarded through the competent medical authority to the Air Ministry.

2. *Procedure for civilian dental surgeons.*—Form 632 (reverse) will be used by civilian dental surgeons, employed on a fee basis, when recommending dental treatment for personnel of a station who do not receive treatment from a service dental officer. The form will be completed in duplicate and disposed of as follows:—

(a) The medical officer will complete Section 1 of the forms and send them with the patient to the dental surgeon who will complete section 2 and return them to the medical officer. (The dental surgeon may carry out immediate treatment of a conservative or surgical nature for fees not in excess of 10s. 6d.)

(b) Where the supply or repair of dentures is recommended the medical officer will complete sub-headings (a) to (e) on the front of the forms and forward them to the Inspecting Dental Officer, Uxbridge, in the United Kingdom, or the competent medical authority abroad, for approval. For other treatment, the medical officer may approve, in section 3, estimates not exceeding £1. Estimates in excess of £1 will be forwarded to the Inspecting Dental Officer, Uxbridge, at home, or the competent medical authority abroad, for approval.

(c) On completion of the treatment, the dental surgeon will complete section 4, obtain the patient's signature in section 5, and pass the forms to the medical officer, who, after satisfying himself that the treatment specified has been satisfactorily carried out and that the amount claimed is correct under K.R. & A.C.I., para. 1572, will complete section 6.

(d) The medical officer will pass one copy of the form to the C.O. of the patient's unit, together with the anaesthetist's account (if any), for payment. The second copy will be forwarded to the Air Ministry (*see* para. 286).

285. Form 657.—Medical Board Summary.—This will be completed for each officer, cadet, member of P.M.R.A.F.

Nursing Service and airman pilot on whom a medical board has been held, and copies passed to—

- (a) The individual to whom it refers ;
- (b) The C.O. of the unit ;
- (c) The headquarters of the group at home, or command abroad ;
- (d) The Air Ministry (at home) ;
- (e) The board office records.

(With regard to regular personnel *see* para. 48 and for officers of the Non-regular Air Forces, paras. 73 and 74).

286. Form 664B.—Internal Repayment Voucher.—This form is used in charging for losses of, damage to and repairs to R.A.F. equipment, *e.g.* plates, mugs, blankets and also dentures and spectacles. When renewals or repairs to dentures not chargeable to public funds have been carried out in accordance with the provision of K.R. & A.C.I., para. 1567, the dental officer, or medical officer (where the work has been performed by a civilian dental surgeon), will prepare Form 664B in duplicate for signature by the C.O. of the unit and by the officer or airman concerned. The C.O. of the unit will then pass both copies of the form to the accountant officer of the patient's unit. The accountant officer will return the duplicate copy to the dental officer, endorsed with a reference to the cash account in which the amount due from an officer is brought to account, or with a reference to the pay ledger in which the sum due from an airman is debited to his account. The dental officer will attach it to Form 632 and forward both forms, through the competent medical authority, to the Air Ministry. The rates to be charged will be those laid down in K.R. & A.C.I., para. 1572, as payable to civilian dental surgeons. (*See* para. 240 with regard to the provision of dentures and para. 392 for spectacles.)

287. Form 668.—Record Card for Loans to Individuals.—The quartermaster of a hospital, the C.O. of a medical unit, medical officer in charge of a sick quarters or dental officer in charge of a dental centre, will keep a record on Form 668 of all articles on loan ; these will be checked monthly. The Quartermaster will make no unusual loan of R.A.F. equipment or other articles held on charge by the hospital to wards or individuals without the authority of the C.O.

288. Form 670.—Ledger Sheet.—For the purpose of recording the total quantities of class "A" and "B" articles of medical and barrack equipment in use at a hospital, the quartermaster will maintain an abstract of all inventories on an articles-in-use ledger sheet Form 670. (*See* para. 377 with regard to the use of Form 670 by competent medical authorities for "A" class medical equipment.)

289. A.M. Form 672.—Record Card for Medical Officers, Dental Officers and Quartermasters.—1. General.—A.M. Form 672 is compiled so as to ensure that a record of an officer's service is kept up to date, and to enable suitable officers to be selected to fill vacancies, having regard to their qualifications, service, etc.

2. Custody.—The Air Ministry will retain the original A.M. Form 672. The competent medical authority of a command, or independent group, will have the custody of a duplicate for each medical officer, dental officer and medical quartermaster serving in the command, and will be responsible that the instructions as detailed below are carried out.

3. Entries.—(a) Entries under the following headings will be amended as necessary from time to time :—

- (i) Nature of commission.
- (ii) Whether married.
- (iii) Next-of-kin (relationship and address).
- (iv) Qualifications.
- (v) Speciality.

(b) The following information will be entered as applicable :—

(i) *Gazettements.*—All appropriate announcements, such as promotions, etc., published in the *London Gazette*, the date of the Gazette being shown.

(ii) *Movements.*—All movements, as published in the Air Ministry Posting Lists, and particulars of stations, unit, duty, whether posted or attached, date of movement, and number of Posting List.

(iii) *Leave.*—All periods of leave in excess of 48 hours.

(iv) *Courses.*—Particulars of all courses taken, whether medical or otherwise.

(v) *Health.*—All periods of sickness and particulars of medical boards.

4. Transit.—(a) In the case of an officer posted from one command to another, the duplicate Form 672 will be forwarded to the competent medical authority of the new command as soon as notification of the intended move is received from Air Ministry.

(b) When an officer is posted overseas from the United Kingdom, or vice versa, the duplicate Form 672 will be forwarded to The Under Secretary of State, Air Ministry at least seven days before the movement is due to take place.

5. Care of form.—Particular care will be taken of these cards. They will not be folded when in use or for the purpose of transit, and one line should usually be sufficient for each entry.

290. Form 673.—Internal Exchange Voucher.—This form is used by all units for the purpose of exchanging equipment within the unit. At a hospital which is not self-accounting, the quartermaster will prepare on Form 673 monthly, or more frequently in special circumstances, a list of articles required to be exchanged, completed in accordance with the instructions laid down in A.P. 830, Chapter 10, Section 3. The form will be forwarded, with the items to be exchanged, to the equipment or barrack officer of the accounting unit who will effect the exchange. When the hospital is self accounting for equipment purposes, the quartermaster will effect exchanges of equipment from store, using Form 675, or by demanding on the appropriate equipment depot, using Form 674.

291. Form 676.—Monthly Return of Dental Treatment.—A detailed daily record of all treatment carried out will be kept by dental officers on Form 1933 and from this record a monthly return will be compiled on Form 676, showing all treatment completed up to the last day of each month. The return will be forwarded in duplicate, as soon as possible after the first day of each month, to the competent medical authority, who will retain one copy and pass the other to the Air Ministry.

292. Form 686.—Medical Board on a Pensioner.—1. This form is required to be completed when a pensioner is brought periodically before a medical board, to assess the degree of disability existing at the time of examination (*see* para. 54 with regard to assessments). In each case instructions will be issued by Air Ministry to the competent medical authority, who will make arrangements for the pensioner to attend for examination at a suitable unit within his command. The form will be completed in duplicate, at least one copy being typewritten, and both copies forwarded to Air Ministry through the competent medical authority. Copies of the proceedings of all former medical boards will be forwarded for the information of the members whenever a pensioner is reboarded.

2. Before an invalid, retained as a free civil patient, is discharged from hospital he will be brought before a medical board and the findings recorded on Form 686. The forms will be disposed of as directed in clause 1.

293. Form 690.—Record of Qualifications. Airmen of the Medical or Dental Branches.—This constitutes a loose-leaf ledger record of each medical or dental airman. It is passed by the Training Officer (Medical), Medical Training Depot, to the Officer i/c Records for completion, on attestation of each medical or dental airman recruit. It is then returned to the Training Officer (Medical), Medical Training Depot, who places each sheet in a Binder (Form 4003), and keeps it completed as

necessary during the whole of the medical airman's career. When the airman is discharged from the service, his Form 690 is inserted in a "dead" ledger where it is retained.

295. Forms 712 and 712A.—Packing Invoice for Medical and Dental Equipment.—These packing invoices give a list, in duplicate, of the medical or dental equipment contained in any particular consignment from a medical stores depot or a contractor. They will be posted to the consignee about the same time as the equipment is despatched, but will not necessarily arrive on the same day. The Medical Stores Depot, Hartlebury, will include an extra Form 712 in each package as a packing note. When the equipment has been checked against the vouchers and found correct, both copies will be signed and the appropriate receipt voucher number allotted. If the quantities of equipment do not tally with the figures in the invoices, these figures will in no circumstances be changed. Form 712 will be retained to support the entry in the medical equipment ledger, and Form 712A will be returned forthwith to the competent medical authority for transmission to Air Ministry accompanied, when necessary, by Form 594 (*see paras. 280, 371 and 387*).

296. A.M. Form 744.—Compensation for Injury—Civilian Officials and Employees or Ex-Officials and Ex-Employees.—This form is originated by Air Ministry in the case of civilian employees disabled in R.A.F. employment, whenever a medical report is required. In it statements are required as to the degree of disablement, recommendations as to means of reducing such disablement and the probability of return to full working capacity in the future. The form normally accompanies Form D. W.C.A. 3 (A) (*see para. 327*).

297. Form 759.—Personal Equipment issued to Patients in Hospital.—The quartermaster or his representative will issue each patient with the personal hospital equipment required on admission to hospital, and obtain the patient's receipt on Form 759. When a patient is so ill as to be unable to sign for his equipment, the individual drawing it for him will sign the form on his behalf. The sister or N.C.O. in charge of the ward will take responsibility for this equipment until the patient is sufficiently recovered to do so himself. Form 759 will be countersigned and dated on each change of custody by the individual taking responsibility. On the patient's discharge from hospital the equipment will be returned to the quartermaster's store and checked, a note being made on the relative Form 759 to this effect.

298. Form 786A (formerly F.S. Form 786).—Receipt for Patients' Valuables. (*See para. 309, clause 2.*)

299. Forms 826 and 827.—Medical Board on Entry of Officers, Cadets, Members of P.M.R.A.F. Nursing Service and Airman Members of Aircraft Crews, including Pilots.—For general description of the form *see* para. 250.—1. These forms are used for recording the proceedings of a medical board when examining an individual as to his fitness to undergo training (*see* para. 48), and also officers of the non-flying branches and members of P.M.R.A.F. Nursing Service on entry. For serving personnel the flimsy will be placed in Form 48 and the card forwarded to the Air Ministry, through the competent medical authority unless the examination has taken place at the Central Medical Establishment when it will be sent direct to the Air Ministry.

2. At the Central Medical Establishment when a candidate or officer of the Army is examined, both card and flimsy will be sent to the Air Ministry. For the Auxiliary Air Force the card will be sent to the Air Ministry and the flimsy to the competent medical officer of the relative command. For pilots of the Reserve the card will be sent to the Air Ministry and the flimsy to the P.M.O. Reserve Command.

3. In completing Form 826 the standard abbreviations only as detailed in A.P. 130 will be used.

300. Form 833.—Report on a Case of Mental Disability.—These forms will be completed in duplicate by the medical board in cases of mental disability. One copy will be sent to The Royal Victoria Hospital, Netley or other service hospital (*see* para. 150, clause 2 (a)) in his Form 48 two clear days before the despatch of the airman to that hospital, and the other retained as an office record (*see* paras. 89 (d) (iii) and 150).

301. Form 834.—Prescription Book and General Purposes Diary.—This form consists of a long narrow book with a stiff cover containing plain ruled sheets, and is used for making demands on a dispensary for "B" and "C" class equipment (*e.g.* clinical thermometers, drugs and dressings). Ordinary prescriptions (as distinct from those containing dangerous drugs) for the treatment of in-patients, and for stock mixtures, etc., will be written on the Form 834 kept in the ward or special department.

302. Form 836.—Prescription Book (Out-patients and Dangerous Drugs).—This consists of a book of which each alternate page is perforated so as to provide a duplicate carbon copy. At medical establishments and sick quarters, prescriptions for out-patients, and patients treated in their own quarters, and also prescriptions containing dangerous drugs, will be written by medical officers on this form.

303. Form 847A.—Medical Board on an Officer, or Member of P.M.R.A.F. Nursing Service, Unfit for the Service or in Receipt of Disability Retired Pay.—This form will be completed for all officers, or members of P.M.R.A.F. Nursing Service, who have been found permanently unfit for further service by a medical board, *i.e.* pensioners. On the first occasion of the form being rendered, Form 497 will be completed also. Form 847A will be completed in duplicate and signed by the president and members of the board. The original will be forwarded to the Air Ministry and the copy filed in the board office.

304. Form 853.—Record Card of Sickness.—This card will be compiled by the competent medical authority for all cases of sickness exceeding 48 hours in the command, from information provided on Forms 38 and 39 (card) by sick quarters and hospitals. Forms 853 will act as a card index record of sickness in the command, and will also be used in checking the nominal roll of patients remaining in sick quarters and hospitals on the last Friday of each quarter, required to be forwarded to the Air Ministry (*see* para. 255, clause 2 (c) (iv)).

305. A.M. Form 857.—Medical Report on Civilian Staff Employed by the Air Ministry.—The medical examination of civilians for civil employment will, when arranged by the Air Ministry, involve the completion of A.M. Form 857, on which the medical officer will record the applicant's declaration as to his family and personal medical history, together with the results of his physical examination. This form will also be utilised to record the results of the examination of civilian employees before posting overseas, and before being certified as fit for duties involving flying (*see* para. 39).

309. Form 1000.—Inventory of Kit for Airmen admitted to Hospital.—1. *On admission to hospital.*—Whenever an airman patient below the rank of warrant officer is admitted to hospital, the quartermaster or his representative will receive his clothing and necessaries with the exception of his service dress cap (and helmet at tropical stations), boots, and canvas shoes, and enter a list of the articles on Form 1000 (in duplicate) indicating the condition of each article. Great care will be observed in registering the articles correctly so that no dispute may arise on the discharge of a patient from hospital. All articles of public clothing received with the airman and not required for his use will be returned to the unit forthwith (*see* para. 206 with regard to clothing, etc., of warrant officers admitted to hospital).

2. *Valuables.*—The quartermaster will take over all medals, money or other valuables brought to hospital by a patient, noting them also on the Form 1000. The patient (or if he is unable, the ward orderly) will sign Form 1000, one copy of which will be handed to him (or the ward orderly as the case may be). A separate receipt on Form 786A for valuables will be handed over at the same time. When receipts are handed to the ward orderly, he will pass them at once to the sister or N.C.O. in charge of the ward for safe custody (*see* para. 297 and K.R. & A.C.I., para. 2600).

3. *Laundry.*—The quartermaster will send the underclothing worn by a patient on admission and also any other soiled articles which may be handed in at the same time to be washed. The soiled articles belonging to each patient will be tied in separate bundles, to each of which a list of contents will be attached. The individual to whom they are handed for the purpose of being washed will initial the entry on Form 1000 (original) as a receipt. On the clean clothes being returned, the bundles will be checked and placed in their respective packs. A nominal roll of the airmen, showing the amount to be charged against each in respect of the cost of washing and mending personal clothing, will be forwarded to the pay accounting section of the unit to which each airman belongs.

4. *On discharge from hospital.*—On the discharge of a patient, the quartermaster or his representative will issue the clothing on the production of a clearance certificate and the receipt held by the patient. The patient will endorse the original Form 1000 on taking over his clothing.

5. *Death of a patient.*—On the death of a patient, the articles will not be issued from the pack store without orders from the C.O. of the hospital.

310. Form 1002. Inventory of Fixtures.—This form is originated by the Works directorate and issued to the C.O. of a unit. Works fittings detailed on it will be taken over and signed for by inventory holders; in a hospital the quartermaster will usually act in this capacity for the C.O.

311. Form 1227.—Stocktaking Report. Hospital Bedding, Linen and Utensil Store.—The quartermaster will check quarterly, or more frequently if necessary, the stock in the linen store and at the same time prepare a stocktaking sheet on Form 1227.

312. Form 1511.—Authority for Admission to a Service Family's Hospital.—1. When the wife or child of an airman (as defined in K.R. & A.C.I., para. 1538), whether on the married establishment or not (and not necessarily resident within

the prescribed radius), is considered by a medical officer to be suffering from a disease requiring hospital treatment, the case will be submitted by the medical officer, on Form 1511, accompanied by a full report, for the approval, subject to accommodation being available, of the competent medical authority. Form 1511 for families of airmen not on the married establishment require to be approved by the air or other officer commanding. This does not apply to diseases of an infectious nature or for chronic disease unless for the purpose of operation or relieving an acute condition. On receipt of approval, the case will be sent to hospital for admission, and Form 1511 forwarded to the C.O. of the hospital. If the approval is for admission to a civil hospital, the form will be retained by the medical officer.

2. In a case of urgency the medical officer will arrange, if possible, for the immediate admission of the patient, Form 1511 being completed and forwarded to the C.O. of the hospital as soon as possible afterwards. (*See para. 152, clause 2.*)

313. Form 1572.—Instructions to Airmen suffering from Syphilis. Form 1573.—Instructions to Airmen suffering from Gonorrhœa.—A copy of one of these cards will be issued to each airman suffering from syphilis or gonorrhœa as soon as he comes under treatment.

314. Form 1643.—Notification of Period spent in Hospital.—The C.O. of a hospital will be responsible that Form 1643, notifying the period spent in hospital and the amount of hospital charges (where recoverable), is prepared from Forms 38 and 39 and rendered in accordance with the instructions on the form. In the case of personnel of the Royal Navy, Royal Marines, and Army, an additional copy of Form 1643 will be sent to the Admiralty or regimental paymaster concerned (*see para. 201*).

315. Form 1664.—Injury Report on Civilian Official or Employee.—When an accident occurs to a civilian employed under the Air Ministry, Form 1664 will be completed by the medical officer in accordance with K.R. & A.C.I., para. 1449, clause 3, and returned to the department or unit originating the form. In completing the form the medical officer will describe thereon the injury sustained and will show as far as possible whether it appears to have resulted from the accident as stated.

316. Forms 1741 to 1750.—Medicine Labels.—The initial issue of medicine bottle labels for new stations will be made from the Medical Stores Depot, Hartlebury, and will be packed

with the initial issue of medical equipment. Subsequent demands will be made in accordance with A.P. 113.

317. Form 1754.—Nominal Roll of Patients (for active service only).—All details as to completion and disposal are included on the form. (*See para. 340 also A.P. 1301.*)

318. Form 1874. Daily Bed State and Nominal Roll of Patients awaiting Transfer to the United Kingdom.—1. The C.Os. of R.A.F. hospitals will render a weekly return on the front of this form, complete to midnight Friday-Saturday, direct to the Air Ministry, a copy being sent to the competent medical authority administering the hospital.

2. On the completion of board proceedings the name of each invalid awaiting transfer to the United Kingdom will be inserted on the reverse of the form and will continue to be shown each week until he or she leaves the command.

319. Form 1883.—Weekly Return of Officers, Cadets, Pupil Pilots, Members of P.M.R.A.F. Nursing Service and Civilian Officials and Employees in R.A.F. hospitals in the United Kingdom.—This form in duplicate, complete to midnight Friday-Saturday, will be forwarded weekly by C.Os., R.A.F. hospitals at home direct to the Director-General of Medical Services, Air Ministry (the envelope being addressed to him by name), with a copy to competent medical authorities on whose strength patients are borne.

320. Form 1892.—Return of Movements of Medical Officers, Dental Officers, Medical Quartermasters and whole time Civilian Medical Practitioners.—This form will be rendered to the Air Ministry (D.G.M.S.) by competent medical authorities weekly in the case of commands in the United Kingdom and fortnightly in the case of commands overseas. It will contain a complete record of all postings and attachments, periods of leave granted, and details of sickness.

321. Form 1927.—Annual Medical Inspection of Children in R.A.F. Schools.—1. Every child will be examined by an officer of the Royal Air Force Medical Service on first admission to a Royal Air Force School and thereafter annually on or about the month of October. The Headmaster or Headmistress will notify the parents or guardians in writing of the date upon which the examination of their children will take place and will point out the desirability of one parent or guardian being present at the examination. The result of

these examinations will be recorded on Form 1927 which will remain in the custody of the Headmaster or Headmistress of the school which the child is attending.

2. In completing the form the following points will be noted :—

(a) *Nutrition*.—General nutrition as distinct from muscular development or physique should be noted, state whether it is normal, below normal, or bad. Under-nourishment is the point to determine, the appearance of the skin and hair, expression, and redness or pallor of the mucous membranes being of particular importance.

(b) *Nervous System*.—Conditions such as nervous strains and disorders, chorea, epilepsy and paralysis should be noted in this section.

(c) *Vision*.—If there are signs of eyestrain or headache, fuller examination should be made subsequently. *Omit vision testing for children under 6 years of age.*

(d) *Hearing*.—If the hearing is abnormal or such as to interfere with class work, subsequent examination of each ear should be undertaken separately. *Apply tests only in general way in case of children under 6 years of age.*

(e) *Teeth*, need of cleanliness and treatment should be recorded.

(f) *General intelligence*.—This may be recorded under the following heads :—(i) Bright, fair, dull, backward ; (ii) mentally defective ; (iii) imbecile. *Omit testing mental capacity of children under 6 years of age.*

The medical details recorded on Form 1927 are confidential and the form should on no account be shown to the child or the parents or guardians of the child to whom it relates. (See A.M.O. A.47/38.)

322. Form 1969.—Monthly Return of Airmen in Hospital in the United Kingdom for more than Three Months.—1. A monthly progress report will be rendered by C.Os. of R.A.F. hospitals in the United Kingdom admitting airmen, for all airmen who have been patients continuously in hospital or hospitals (including periods of sick leave) for periods of 3 months or over. The names will continue to be shown monthly until the patients have been discharged. The return will be rendered in duplicate and accompany the first Form 38 of each month, to the competent medical authority who will pass one copy to the Air Ministry.

2. Competent medical authorities collecting Forms 38 for patients in R.N., Army and Civil hospitals will be responsible for rendering similar returns, compiled with the assistance of Forms 853, for such patients in these hospitals (with regard to civil hospitals *see* K.R. & A.C.I., para. 1512, clause 2).

325. Form 3172.—X-Ray Examination Report.—This form will accompany every patient sent for X-Ray examination. The particulars of the patient will be filled in at the top of the sheet and a short history on the left-hand side, by the medical officer in charge of the case. The radiologist will insert his report in the space provided and return the form as soon as possible to the medical officer in charge of the case, who will enter a copy of the radiologist's report on Form 41.

326. Form 3499.—Notification of Airmen to attend for Dental Treatment.—All appointments for dental treatment will be entered on this form by the dental officer, and passed to the C.O. of the station or unit concerned. The C.O. will be responsible that patients attend the dental centre at the times indicated thereon.

327. Form D. W.C.A. 3 (A.) Workman's Compensation Act Certificate.—This form will be originated by Air Ministry whenever it is considered that the degree of disability of a civilian employed by the Air Ministry, and receiving compensation under the Workman's Compensation Act, is likely to have changed. The form is usually accompanied by A.M. Form 744. The relative Act demands that in the event of the assessment being altered, the man must be informed thereof within six days of the date of examination. It is therefore necessary for the completed Forms D. W.C.A. 3 (A.) and A.M. Form 744 to be returned to the Air Ministry, *immediately on completion of the medical examination.*

SECTION II.—RETURNS

333. Airmen Discharged with Less than Twelve Months Service in accordance with K.R. & A.C.I., para. 652, clauses 4 (a) and (b) and 19.—A quarterly return of airmen discharged with less than twelve months' service will be rendered by the competent medical authority on 1st of January, April, July and October of each year to the Medical Inspector of Recruits, Victory House, Kingsway, London, W.C.2, with a copy to Air Ministry. Aircraft apprentices, apprentice clerks, boy entrants, and direct entry airman pilots will not be included in the return.

334. Out-patient Treatment of R.A.F. Personnel in Service Hospitals other than those of the Royal Air Force.—A nominal roll in duplicate of all R.A.F. personnel treated in service

hospitals other than those of the Royal Air Force will be prepared monthly, stating the nature of the treatment afforded to each individual and the method of conveyance for the treatment. The return will be forwarded to the competent medical authority for transmission to the Air Ministry (*see* para. 112).

335. Monthly Return of Lectures.—A return will be rendered to the competent medical authority of the command on the last day of each month, showing the number of lectures delivered, the subject matter of each lecture, and the date of its delivery (*see* para. 135).

SECTION III.—MEDICAL RECORDS AND RETURNS ON ACTIVE SERVICE

340. Medical Records and Returns on Active Service.—

1. *Form 48 (Medical History Envelope).*—This form will continue to be used as laid down in K.R. & A.C.I., para. 1493, except for units serving in or proceeding to theatres of war. In these circumstances the medical history envelopes for officers and airmen will be forwarded by the C.O. of the unit to the Air Ministry and to the Officer i/c Records, respectively, for retention (*see* para. 269, clause 3 with regard to the recording of vaccinations and inoculations).

2. *List of forms and records to be used.*—The following are the only statistical forms and medical records required to be rendered in the theatre of war:—

(a) *By Unit or Depot Sick Quarters* :—Forms 38, 540, 550, 3118, 3118A and S.O. Book 124.

(b) *By R.A.F. Medical Receiving Stations* :—Forms 38, 540, 550, 739, 747, 1753, 1754, 3118, 3118A and S.O. Book 124.

(c) *By R.A.F. Base Hospitals* :—Forms 38, 39 (card and flimsy), 41, 540, 550, 739, 747, 1753, 1754, 3118, 3118A and S.O. Book 124.

Note.—Forms 3118 and 3118A are included in medical panniers, all other forms and stationery in the unit stationery box (*see* A.P. 1270).

3. *Disposal of R.A.F. sick and wounded.*—R.A.F. sick and wounded personnel will normally be treated by squadron medical officers in the first instance and then evacuated to the nearest suitable medical unit by R.A.F. transport.

4. *Evacuation of sick and wounded in combined operations.*—In combined operations with the Army, the evacuation of sick and wounded R.A.F. personnel from army medical units will normally be carried out under army medical arrangements (*see* A.P. 1301, Part II).

5. *Statistics—general.*—For the theatre of war, medical statistics will be compiled from field medical cards, Form 3118 (Army Form W.3118), and hospital or sick list record cards, Form 39 (Army Form I.1220). These forms will also constitute the medical history on which eligibility for a disability pension will be decided ; every effort must therefore be made to ensure their correct preparation and disposal. Elsewhere the peace-time procedure will be followed as laid down in Section I of this Chapter.

6. *Casualty Returns.*—(a) *Medical Units.*—All medical units will render a daily return of casualties on Form 1754 as follows :—In the United Kingdom, for officers, to the Air Ministry and for airmen, to the Officer i/c Records, and abroad for all personnel to the Base Personnel Staff Officer with a copy to Air Headquarters. Personnel of Training Command will not be included in the returns rendered by medical units at home. The return will cover the 24-hour period ending at midnight and will be rendered as soon after midnight as possible. In addition and in similar circumstances a fortnightly return will be rendered on Form 1753 on Sundays at 1800 hours.

(b) *Non-medical Units.*—Medical officers of non-medical units will render to the C.O. of their units such information as is necessary for the completion of Forms 739 and 747. Nil returns will not be rendered (*see* A.P. 1301, Part II, Chapter XIII, paras. 25 to 28 and Appendix III).

7. *Forms 3118 and 550.*—Form 3118 and the temperature chart Form 550 (Army Form B.181A), inserted when necessary, are enclosed in the waterproof envelope Form 3118A (Army Form W.3118A.)

8. *Form 3118A.*—Form 3118A with enclosures will, as far as practicable, be completed by the medical officer and attached to the patient before his removal from the field, or prepared for every patient admitted to or transferred to field ambulances, R.A.F. receiving or army clearing stations or hospitals, if one did not accompany the patient on admission or transfer. It will accompany each patient through the various medical units to which he may be transferred until finally disposed of by discharge to duty, or by death. (For disposal of form *see* clause 11.)

9. *Forms 39 and 41.*—Forms 39 (A.F. I.1220) and 41 will be prepared for every patient admitted to hospital and will be completed as far as is practicable in accordance with para. 256. Forms 39 (card and flimsy) will not accompany the patient from one medical unit to another. (For disposal of form *see* clause 11.)

10. *Form 38* will be rendered weekly by unit sick quarters and R.A.F. medical units in the field. Separate Forms 38 will be used for the following :—

- (a) R.A.F. personnel.
- (b) Army personnel.
- (c) All others.

The forms will be completed as far as is practicable in accordance with the procedure laid down in para. 255. The flimsy sheets will be forwarded on Saturday of each week to the competent medical authority for despatch to the Secretary, Air Ministry. The book of duplicate copies will be retained at the unit until all flimsies have been used, when it will be forwarded to the competent medical authority for transmission to Air Ministry. The counterpart of Form 38 in the Army is Army Book 27A.

11. *Weekly disposal of forms.*—On Saturdays of each week the following forms will be despatched to the competent medical authority for transmission to the Secretary, Air Ministry :—

(a) From unit sick quarters and R.A.F. medical units in the field :—

(i) Forms 3118A (with enclosures) for all patients discharged to duty or who have died during the week.

(b) From R.A.F. hospitals :—

(i) Forms 39 (card and flimsy) for all patients discharged to duty or to a convalescent depot, transferred to another hospital or hospital ship, or who have died.

(ii) Forms 3118A (with enclosures) for all patients discharged to duty or who have died during the week.

(c) Medical records and statistical forms for R.A.F. personnel in army medical units will, in similar circumstances, be forwarded direct by those units to the War Office. (A.M.D.2.)

12. *Final disposal of Forms 39 and 3118A.*—Forms 3118A with enclosures and Forms 39 (A.F. I.1220) in respect of R.A.F. personnel treated in army medical units will be forwarded to the Air Ministry by the War Office, while those for army personnel treated in R.A.F. medical units will be forwarded to the War Office by the Air Ministry.

13. *Diary Form 540.*—Form 540 will be utilized as a diary by all sick quarters and medical units, each page being ruled into 3 columns headed :—

- (a) Date
- (b) Location
- (c) Remarks. (To include names and strengths of units whose sick are being treated, changes of medical officer

personnel, amalgamation with other medical units, notes of movements of the medical units or sick quarters from place to place.) An entry should be made at least once weekly. As these books are likely to be of use in assessing eligibility for disability pensions they will, on closure, be forwarded to the Secretary, Air Ministry.

14. *S.O. Book 124.*—S.O. Book 124 will be used by unit sick quarters and medical units in the field as a record of all individuals reporting sick, with short notes on their medical disabilities, treatment, progress and disposal (with regard to the record of medical categories, *see* para. 269, clause 3). For hospitals the book will be used in the medical inspection room only and will record details of sickness for personnel attending from local units direct.

15. *Typing of medical statistics.*—When no typewriter is available at a station sick quarters arrangements will be made for the use of that in the administrative office of the unit.

16. *Army medical regulations.*—Instructions regarding record and return procedure for the Army are contained in "Regulations for the Medical Services of the Army", Appendix 14.

SECTION IV.—PERIOD AFTER WHICH BOOKS, DOCUMENTS AND FORMS MAY BE DESTROYED

350.	Description.	No. of years.
1.—(a)	Correspondence (including telegrams) of a minor or routine nature concerning postings, equipment, messing, etc.	Three years.
(b)	Correspondence of temporary importance only.	Ten years.
(c)	Registers kept in connection with correspondence, equipment, carriage, attendance, etc.	Three years.
(d)	Returns of a minor nature, forwarded from lower to higher formations.	Three years.
(e)	Ledgers used in connection with equipment accountancy.	One year* after audit.
(f) (i)	Account books, cheque books, returned cheques, pass books.	Six years after audit.
(ii)	Paying-in slips, etc.	One year.
(g)	Discrepancy reports in connection with consignments of equipment. (All discrepancies have to be cleared before the accounts can be passed.)	One year* after audit.

- (h) Equipment vouchers and invoices .. One year* after audit.
- (i) Carrier's, shipping, and convoy notes, bills of lading, railway warrants and counterfoils. Three years.
- (j) "Handing over" and "taking over" certificates. Six years.
- (k) Reports of Courts of Enquiry as to thefts, losses and fires. Two years.
- (l) Reports of Boards of Audit, survey on equipment, and stocktaking. One year* after audit.
- (m) Medical examination reports on candidates for commissions—(a) accepted Forty years.
(b) rejected Three years.

2. Forms.

No. of Form.	No. of Years.	No. of Form.	No. of Years.
2	Three years.	591	One year.
21	One year after audit.	594	One year after audit.
24	One year.	600	One year after audit.
25A	One year after audit.	603	One year after audit.
29A	One year after audit.	604	One year after audit.
33A	One year after audit.	605	One year.
34	One year after audit.	624	One year.
36	Three years.	624A	One year.
38	Three years.	632	One year.
41	Three years.	657	Three years.
43	Three years.	664B	One year after audit.
47	Five years.	666	One year.
58	Five years.	668	One year after audit.
241	Three years.	670	One year after audit.
336	One year.	673	One year after audit.
359	Ten years.	674	One year after audit.
415	One year after audit.	675	One year after audit.
418	One year.	676	One year.
460	Three years.	681	One year after audit.
474	Three years.	712	One year.
495	Three years.	712A	One year after audit.
496	Three years.	759	One year after audit.
499	Three years.	773	One year after audit.
503	One year after audit.	786A	Three years.
548	Three years.	823	One year after audit.
549	Three years.	827	Forty years.
578	One year.	834	Three years.

* Documents under this category should be retained for a minimum period of three years (four years in the case of Stores Depots).

<i>No. of Form.</i>	<i>No. of Years.</i>	<i>No. of Form.</i>	<i>No. of Years.</i>
836	One year after audit.	1536	One year after audit.
853	Five years.	1666	One year.
922	One year after audit.	1667	One year.
1000	Three years.	1874	One year.
1202	One year after audit.	1883	Three years.
1209	One year after audit.	1922	Three years.
1218	One year after audit.	1927	Three years.
1227	Three years.	1969	Three years.
1230	Three years.	3172	One year.
1251	Three years.	3212	Three years.
1511	One year.	3467	One year.
3. Books.			
Daily Sick Book	.. ..	.. ..	Thirty years.
Medical Comforts Book	.. ..	.. ..	Three years.
Record of M.T.	.. ..	.. ..	Three years.
Register of civilian medical practitioner's claims.			Five years.
Register of hospital claims	.. ..	.. ..	Five years.
Sanitary Diary	.. ..	.. ..	Three years.
Venereal Diseases Register	.. ..	.. ..	Five years.
Ward Orderlies' Report Book	.. ..	.. ..	Three years.
Ward Treatment Book	.. ..	.. ..	Three years.

SECTION V.—LIST OF FORMS AND PUBLICATIONS USED BY MEDICAL AND DENTAL BRANCHES

- 355.** Form 2. Proceedings of a Board of Officers, or Court of Inquiry (*see* para. 105).
- „ 10. R.A.F. Medical Store Label.
- „ 10A. R.A.F. Medical Store Label (Poisons and Dangerous Drugs).
- „ 21. Conversion or Certificate Voucher (pads of 100) (*see* paras. 375 and 390, clause 4).
- „ 22. Furniture and Barrack-room Equipment. Scale of Entitlement and List.
- „ 23. Medical Attendance, Quarterly List of persons entitled (*see* para. 251).
- „ 24. “ Nil ” Return (*see* para. 250, clause 7).
- „ 25A. Washing Account Book. For use of R.A.F. Hospitals (book) (*see* para. 252, clause 2 (*d*)).
- „ 29A. Certificate of Exchange of Soiled Hospital Clothing and Bedding, for clean (pads of 100 in duplicate) (*see* para. 252).

- Form 33A. Equipment. Certificate of Stocktaking
(*see* para. 389).
- „ 35. Examination of Non-flying Personnel.
Medical Record (pads of 25 in
duplicate) (*see* para. 253).
- „ 36. Manuscript Notes for completing Form 35
(*see* para. 253).
- „ 37. Inventory of R.A.F. Equipment (*see*
paras. 254 and 374).
- „ 38. Weekly Sick Return (books of 100 in
duplicate) (*see* paras. 255, 340 and 550).
- „ 39. Hospital or Sick List Record. Consultant's
or special reports (*see* paras. 256, 340
and 550).
- „ 39. (Continuation). Hospital or Sick List
Record. Consultant's or special reports
(*see* paras. 256, 340 and 550).
- „ 41. Case Sheet, and rough manuscript for
completing Form 39 (*see* paras. 256,
325, 340 and 550).
- „ 41. (Continuation). Case Sheet, and manu-
script notes for completing Form 39
(*see* paras. 256, 340 and 550).
- „ 42. Special Medical Examination Record
(pads of 25 in duplicate) (*see* para. 257).
- „ 43. Manuscript notes for completing Form 42
(*see* paras. 257 and 340).
- „ 46. Medical Board on Officer, Cadet, Member
of P.M.R.A.F. Nursing Service or
Airman pilot Record (pads of 25 in
duplicate) (*see* para. 258).
- „ 47. Manuscript notes for completing Form 46
(*see* para. 258).
- „ 48. Medical History Envelope (*see* paras. 259
and 340).
- „ 58. Report on Findings of Medical Board or
special Medical Examination (*see*
paras. 48 and 260).
- „ 62. Medical Examination of Recruits, Appren-
tices and Boy entrants—Interrogatory
form (*see* paras. 88 and 261).
- „ 64. Airman's Service and Pay Book (for
active service only) (*see* para. 262).
- „ 78. Recommendation for re-engagement of
Airmen (*see* K.R. & A.C.I., para. 1446).

- Form 82. Application for an Airman to extend his service (*see* K.R. & A.C.I., para. 1446).
- „ 122. Doping, Instructions to prevent ill effects—Poster.
- „ 150. Prohibition of spitting—Poster.
- „ 152. Discharge of Airman from the Service in accordance with K.R. and A.C.I., para. 652 (4). Notification to Ministry of Health (*see* para. 91).
- „ 155. Embarkation of R.A.F. Families : Medical Certificate (*see* paras. 38, 263 and K.R. & A.C.I., para. 937).
- „ 166. General Directions to Consumptive Persons (*see* para. 264).
- „ 174. Titanium Tetrachloride, Warning Poster.
- „ 182. Trade Test Card of Airmen employed on Medical and Dental duties (pads of 25 in triplicate) (*see* paras. 187 and 265 and K.R. & A.C.I., Chapter X, Section II).
- „ 184. Demand Form for Published Books (*see* (A.B.C.) para. 20).
- „ 204. Medical Stores : Address label (Hartlebury).
- „ 241. Weekly Summary of sickness in Commands. Air Ministry Health Summary (*see* para. 266).
- Forms 261, Order for Reception of a Dangerous
262 Person of Unsound Mind—(For Eng-
& land, North Ireland and Scotland,
263. respectively) (*see* para. 150, clause 5 (b)
and K.R. & A.C.I., para. 662, clause
1 (b)).
- Form 295. Airman's Pass (pads of 100) (*see* K.R. &
A.C.I., Chapter XVIII, Section II).
- „ 323. Discharge Certificate, Temporary (*see*
para. 91).
- „ 336. Annual Vaccination and Inoculation
Return (*see* para. 267).
- „ 345. Orders for Patients in Hospitals (*see*
para. 268).
- „ 359. X-ray Register (book).
- „ 373. Record Card, Officers (*see* para. 269).
- „ 395. Particulars of Discharge or Transfer to
the Reserve (*see* para. 91).

- Form 400. Descriptive return of an Airman on Discharge (*see* para. 91).
- „ 413. Railway Warrant for Journeys in the United Kingdom (pads of 50).
- „ 415. Certificate of issue of Surgical Appliances (*see* paras. 270 and 374, clause 3 (c)).
- „ 417. Railway Warrant for Journeys in the United Kingdom (Civilian Staff) (pads of 50).
- „ 418. Infectious Diseases—Notification (books of 50) (*see* para. 271).
- „ 445. Cover for Airman's Service Documents.
- „ 460. Notification of Tuberculosis to the Medical Officer of Health (*see* paras. 91 and 271).
- „ 473. Routine Pathological Overhaul (pads of 25 in duplicate) (*see* para. 842).
- „ 474. Manuscript notes for completing Form 473 (*see* para. 842).
- „ 478. Venereal Disease Case Card (*see* para. 273).
- „ 494. Record of Airmen for Training as Pilots, with Medical Certificate (*see* para. 257, clause 3).
- „ 495. Record of Surgical Operations performed (book).
- „ 496. Application for, and Medical Board proceedings on an Airman or Reservist—Non-flying (*see* paras. 83 to 94).
- „ 496A. Medical Board on an Airman suffering from Tuberculosis—Special report (*see* paras. 91 and 275).
- „ 497. Medical Board on an Officer—Statement by Officer concerning his own case (*see* para. 303).
- „ 499. Certificate of freedom from Infectious Disease. Apprentices and Boy Entrants on first reporting for duty.
- „ 503. Inventory card for Text Book Libraries (*see* para. 20).
- „ 522. Weight Record Card (*see* para. 277).
- „ 540. Operations Record Book (Unit History) (*see* para. 340, clause 13, and K.R. & A.C.I., paras. 2349 and 2350).
- „ 548. Hospital Supplies—Tender.
- „ 549. Clinical Temperature Chart (Four-hourly).

- Form 550. Clinical Temperature Chart (Active service only) (*see* para. 340, clause 7).
- „ 551. Report on Injury (*see* para. 202, clause 2, and K.R. & A.C.I., para. 2313).
- „ 578. Clearance Certificate (pads of 150) (*see* para. 197).
- „ 591. Receipt for Documents (*see* para. 278).
- „ 594. Discrepancy Report (pads of 150) (*see* paras. 279 and 371).
- „ 600. Demand, Issue and Receipt Voucher (pads of 50) (*see* paras. 281, 370, 371, 385, 387, 388, 393, 395, 400 and A.P. 830, Vol. I, Chapter V, para. 2, clause 12).
- „ 603. Issue Vouchers—for issues to other than R.A.F. Units (pads of 200) (*see* paras. 386, 387 and 491).
- „ 604. Packing Note (pads of 100) (*see* para. 385).
- „ 605. Stores Inwards Book.
- „ 624. Sick or Medical Inspection Reports (*see* para. 282).
- „ 624A. Sick or Medical Inspection Report (*see* para. 283).
- „ 632. Dental Report—supply or repair of dentures and civilian dental surgeon's estimate (*see* para. 284).
- „ 634. Reporting Card, Reservists (*see* A.P. 938).
- „ 657. Medical Board Summary (pads of 100) (*see* para. 285 and K.R. & A.C.I., para. 1435).
- „ 664B. Internal repayment Voucher for use in charging for loss of, or damage to, R.A.F. Equipment (pads of 100) (*see* para. 286) or for dentures (*see* para. 240) or spectacles (*see* para. 392) on repayment.
- „ 666. Contractor's Bill (*see* para. 370, clause 5).
- „ 668. Record Card for Loans to Individuals (*see* paras. 287 and 525).
- „ 670. Ledger Sheet (*see* paras. 288 and 377 *also* A.P. 830, Vol. I, Appendix 3).
- A.M. „ 672. Record Card for Medical Officers, Dental Officers and Quartermasters (*see* para. 289).

- Form 673.** Internal Exchange Voucher—for use within Units (pads of 50 in triplicate) (*see* paras. 290, 374 and A.P. 830, Vol. I, Chapter 10, para. 29 and Appendix 3, para. 11).
- „ 674. Internal Demand and Issue Voucher—for use within Units (pads of 50 in triplicate) (*see* paras. 290, 374 and 378).
- „ 675. Internal Return and Receipt Voucher—for use within Units (pads of 50 in triplicate) (*see* paras. 290, 374 and A.P. 830, Vol. I, Chapter 10, Section 4).
- „ 676. Monthly Return of Dental Treatment (*see* para. 291).
- „ 681. (Outside) Board of Survey on Equipment (*see* paras. 388, 390 and 413).
- „ 681. (Inside) Board of Survey on Equipment (*see* paras. 388, 390 and 413).
- „ 682. Annual Confidential Report (Medical and Dental Officers) (*see* K.R. & A.C.I., para. 1097).
- „ 686. Medical Board on a Pensioner (*see* para. 292).
- „ 690. Airmen of the Medical and Dental Branches. Record of Qualifications (*see* para. 293).
- „ 712. Packing Invoice for Medical and Dental & Equipment (pads of 50 pairs) (*see* 712A. paras. 295, 371 and 387).
- „ 739. Casualty Form—Airmen (*see* Para. 340.)
- A.M. „ 744. Compensation for Injury—Civilian Employees or Ex-employees (*see* paras. 39 and 296).
- „ 747. Casualty Form—Officers (*see* para. 340).
- „ 759. Personal Equipment issued to Patients in Hospital (*see* para. 297).
- „ 773. Hospital Supplies Requisition Form (pads of 50 in duplicate) (*see* para. 500 and A.P. 112, Chapter XX, para. 15 (iv)).
- „ 786A. Receipt for Valuables of Patients (books of 50 in triplicate) (*see* para. 298).
- „ 823. Equipment and hospital provisions Ledger Sheet (*see* paras. 185, 374 and 378).

- Form 826. Medical Board on Entry of Cadets, Officers and Members of P.M.R.A.F. Nursing Service and Airman Pilots on selection (pads of 25 in duplicate) (*see* para. 299).
- „ 827. Manuscript Notes for completing Form 826 (*see* para. 299).
- „ 833. Report on a case of Mental Disability (*see* para. 300).
- „ 834. Prescription Book and General purposes Diary (*see* para. 301).
- „ 836. Prescriptions (out-patient or dangerous drugs) (books of 100 in duplicate) (*see* paras. 302 and 382).
- „ 847A. Medical Board on an Officer or Member of P.M.R.A.F. Nursing Service Unfit for further Service or in Receipt of Disability Retired pay (*see* para. 303).
- „ 848. Messing Account—Airmen (*see* para. 188).
- „ 853. Record Card of Sickness (for Competent Medical Authority's use) (*see* para. 304).
- A.M. „ 857. Medical Report on Civilians employed by the Air Ministry (*see* paras. 39 and 305).
- „ 893. Correspondence Register (Book).
- „ 922. Outwards consignment sheet (*see* para. 385, clause 4).
- A.M. „ 942. Preliminary Medical Examination of a Recruit—certificate (*see* A.P. 1129).
- „ 993. Attestation paper for Enlistment into Section II of Class “E” (R.A.F.) Reserve.
- „ 1000. Inventory of kit for Airmen Admitted to Hospital (*see* para. 309).
- „ 1002. Inventory of Fixtures (*see* para. 310).
- „ 1027. “The Fly is your Enemy” (Poster).
- „ 1198. Washing and Repairing of Hospital Bedding, Clothing, etc. (used in Middle East Command only).
- „ 1202. Hospital Diet Sheet (*see* A.P. 112, Chapter XX, para. 15).
- „ 1209. Indent or Issue and Receipt Voucher for Medical Equipment (pads of 100) (*see* paras. 239, 368, 369, 384, clause 6, 387, 392, 394 and 428).

- Form 1218. Steward's Diet Record (*see* A.P. 112, Chapter XX, para. 15).
- „ 1227. Stocktaking Report. Hospital Bedding, Linen and Utensil Store (*see* para. 311).
- „ 1230. Report on Deficient and Damaged Medical and Dental Equipment. (For detailed procedure, *see* K.R. & A.C.I., para. 1646. *See also* paras. 371, 376, 388, 389, 392, 400 and 420.)
- „ 1251. Detailed Accommodation Record (*see* para. 192).
- „ 1370. Cover for Air Ministry Orders.
- „ 1480. Label for Patient's Kit (*see* para. 185, clause 12 (a)).
- „ 1511. Authority for admission to a Service Families' hospital (*see* para. 312).
- „ 1536. Diet Summary (pads of 100) (*see* A.P. 112, Chapter XX, para. 15).
- „ 1542. Medical certificate for Officers' families proceeding overseas (*see* K.R. & A.C.I., 937).
- „ 1572. Instructions to Airmen suffering from Syphilis (*see* para. 313).
- „ 1573. Instructions to Airmen suffering from Gonorrhoea (*see* para. 313).
- „ 1643. Notification of period spent in Hospital (*see* para. 314).
- „ 1661. Medical Examination of Recruits and Civil Employees. Civil Medical Practitioner's Claim (*see* K.R. & A.C.I., para. 1551).
- „ 1664. Injury report on Civilian employee (*see* para. 315, A.P. 826, Chapter XIV, Section II, and K.R. & A.C.I., para. 1449).
- „ 1666. Quarterly Claim for Medical attendance at contract rates, Civil Medical Practitioners (*see* K.R. & A.C.I., para. 1551).
- „ 1667. Civil Medical Practitioners. Claim for medical attendance not at contract rates (*see* para. 117, clause 3, and K.R. & A.C.I., paras. 1400 and 1551).
- „ 1707. Employment of unestablished civilians (*see* A.P. 826).

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|------------|------------------------------|--|
| Form 1741. | Label, " Not to be taken " | <i>See</i>
A.P. 132,
Scale No.
A.1, Section
1 (a). |
| " 1742. | Label, " Poison " | |
| " 1743. | Label, " Ward ", large | |
| " 1744. | Label, " Ward," small | |
| " 1745. | Label, " Shake the Bottle " | |
| " 1746. | Label, " External use only " | |
| " 1747. | Label, " The Ointment " | |
| " 1748. | Label, " The Tablets " | |
| " 1749. | Label, blank | |
| " 1750. | Label, " The Pills " | |
- " 1753. Fortnightly strength return of Airmen
(for active service only) (*see* para. 340).
- " 1754. Nominal Roll of Patients Admitted,
Discharged, Died or Transferred to or
from D.I. or S.I. List (for Active
Service only) (*see* paras. 317 and 340 and
A.P. 1301, Chapter XIII, Part II,
para. 27 and Appendix III).
- " 1754. (Continuation). Nominal roll of Patients
Admitted, Discharged, Died or Trans-
ferred to or from D.I. or S.I. List (for
Active Service only) (*see* paras. 317 and
340 and A.P. 1301, Chapter XIII,
Part II, para. 27 and Appendix III).
- " 1768. Prescription for Spectacles (pads of 100)
(*see* paras. 392 and 393).
- " 1874. Daily Bed State and Nominal Roll of
Patients awaiting transfer to the United
Kingdom (*see* para. 318).
- " 1883. Weekly Return of Officers, Cadets, Pupil
pilots and members of P.M.R.A.F.
Nursing Service in R.A.F. Hospitals in
the United Kingdom (*see* para. 319).
- " 1889. Geneva Convention Identity Certificate
(*see* A.P. 1301, Chapter XIV, para. 44).
- " 1892. Return of Movements of Medical Officers,
Dental Officers, Medical Quartermasters
and whole-time Civilian Medical Practi-
tioners (*see* para. 320).
- " 1922. Monthly Return of Provisions consumed
in Hospital (*see* A.P. 112, Chapter XX,
para. 15, clause IX).

- Form 1926. Vaccination and Inoculation State—Troopships (*see* para. 507).
- „ 1927. Annual Medical Inspection of Children in R.A.F. Schools (*see* paras. 38 and 321).
- „ 1933. Daily Record of Dental Treatment (*see* paras. 234 and 291).
- „ 1969. Monthly Return of Airmen in Hospital in the United Kingdom for more than three months (*see* para. 322).
- „ 1985. Form 48—Register (*see* para. 259).
- „ 1988. Infectious Diseases Register.
- „ 3118. Field Medical Card (*see* para. 340).
- „ 3118A. Envelope for Field Medical Card (*see* para. 340).
- „ 3172. X-ray Examination Report (pads of 50) (*see* para. 325).
- „ 3212. Laboratory Examination Report (pads of 50) (*see* para. 721).
- „ 3456A. Airmen Discharged. Postcard for Notification of Change of Address (*see* para. 91).
- „ 3467. Maintenance Claim, R.A.F. personnel in Civil Hospitals (*see* para. 166 and K.R. & A.C.I., 1515 and 1534).
- „ 3499. Notification of Airmen to attend for Dental Treatment (pads of 100) (*see* para. 326).
- „ 4003. Binder for Form 823 (*see* para. 374).
- C.A. „ 36. Civil Aviation Medical Examination Form (" B " Licence) (*see* para. 260).
- Army Book 55. Indent for Rations (for active Service only).
- Army Form B.178. Medical History Sheet (*see* para. 259, clause 3 (b) (iii)).
- „ „ G.997. Indent for Ordnance Stores (for Active Service).
- „ „ L.1393. Indent for publications, forms and stationery (for Active Service) (*see* A.P. 1301, Part II, Chapter IX, para. 21).

Form D. W.C.A. Workman's Compensation Act Certificate (see para. 327).
3(A)

Board „ T.194. Scale of Medical Comforts supplied on
of Trade Transports (see para. 500).

„ „ **T.462.** Receipt for Medical Comforts and Extra
Issues (see para. 500).

„ „ **T.560.** Accommodation on Transports (see para.
489).

Ministry of Health

Form V.15. Treatment of Venereal Disease. Personal
Card (see para. 91).

Ministry of Labour Registration of Ex-Regular Airmen for
Form E.D.17. Civil Employment (see para. 91).

Ministry of Labour

Form U.I.3.X.S. (including Form U.I.69.X.S.). Application
by an Airman for an Unemployment
Book (see para. 91).

Home Office

Form 397. Oil Dermatitis (Poster).

„ „ **923.** The First Aid Treatment of Minor Injuries.

360. Publications

A.P. 87. R.A.F. Manual of Cooking and Dietary.

„ **112.** Regulations for Supplies Services.

„ **113.** List of Forms, Publications and Diagrams
with Instructions regarding the supply of
Printed Matter and Stationery.

„ **121.** Regulations for admission to the R.A.F.
College, Cranwell.

„ **130.** The Medical Examination for Fitness for
Flying.

„ **132.** Scale of Medical and Dental Equipment.

„ **804.** Manual of Air Force Law.

„ **826.** Regulations for Civilian Employees at Air
Ministry Establishments.

„ **830.** R.A.F. Equipment Regulations. Volume 1.
Administration and Accounting.

„ „ **R.A.F. Equipment Regulations. Volume 2.**
Storage and Packing.

„ „ **R.A.F. Equipment Regulations. Volume 3.**
Scales and Schedules of R.A.F. Equipment.

„ **855.** Regulations for Work Services.

- A.P. 857. R.A.F. Specimen Conduct Sheet.
- „ 875. Annual Reports on the Health of the R.A.F.
- „ 938. Reserve Regulations for the R.A.F.
- „ 947. General Instructions for the Treatment of Correspondence in the R.A.F.
- „ 958. King's Regulations and Air Council Instructions.
- „ 968. Regulations for Auxiliary Air Force and County Associations.
- „ 985. Syllabus for Training of Airmen of the Medical and Dental Trades.
- „ 1075. Regulations for the Princess Mary's R.A.F. Nursing Service.
- „ 1081. R.A.F. Pocket Book.
- „ 1086. Priced Vocabulary of R.A.F. Equipment.
- „ 1096. Mobilization Regulations for the R.A.F.
- „ 1112. Extracts from K.Rs. and A.C.I.'s affecting Promotion, Mustering and Trade Tests of Airmen.
- „ 1129. Instructions for the Guidance of Medical Officers in the selection of Recruits for the R.A.F.
- „ 1269. Manual for Medical and Dental Officers of the R.A.F.
- „ 1270. Tables of Stationery, Forms and Publications which will be taken into the field by R.A.F. Units.
- „ 1301. R.A.F. War Manual, Part 2—Organization and Administration.
- „ 1407. Standard instructions for keeping Non-Public Accounts. Part I. Officers' Mess Accounts.
- „ 1408. Standard instructions for keeping Non-Public Accounts. Part II. Sergeants' Mess Accounts.
- „ 1409. Standard instructions for keeping Non-Public Accounts. Part III. Service Institute Accounts.
- „ 1486. Medical Notes and First Aid Treatment for Detached Personnel in the Tropics and Sub-Tropics.
- „ 1494. Notes on Procedure in connection with trial by Court Martial.
- „ 1510. R.A.F. Manual Defence Against Gas.

C.D.24

Table of Disability Assessments of Specified Injuries.

Manual of Chemistry for Dispensers.

Manual of Instruction for the Royal Naval Sick Berth Staff.

Manual of Military Hygiene and Sanitation.

Medical Manual of Chemical Warfare.

Memoranda on Medical Diseases in the Tropics and Sub-Tropical Areas.

Nomenclature of Diseases.

Priced List of Medical Equipment (Army).

Royal Army Medical Corps Training Manual.

Regulations for the Medical Services of the Army.

CHAPTER IV

MEDICAL AND DENTAL EQUIPMENT

SECTION I.—GENERAL INSTRUCTIONS REGARDING DEMAND, SUPPLY, ACCOUNTING AND STORAGE

365. R.A.F. Medical Store Depots.—1. *Hartlebury.*—The C.O. will be responsible to, and will communicate direct with, the Director-General of Medical Services, Air Ministry, on all matters affecting his duties, in the performance of which he will be guided by special instructions issued to him as necessity arises.

2. *Other depots.*—Officers in charge will be responsible to the competent medical authority of the command in which the depot is situated, for the custody, maintenance, expenditure, etc., of all equipment in their charge, and will communicate direct with the competent medical authority concerned on all matters connected therewith.

366. Scales.—1. The authorized scales of medical and dental equipment for sick quarters and dental surgeries respectively are laid down in A.P. 132.

2. There are no scales laid down for hospitals.

367. Classification.—At hospitals, sick quarters and medical establishments (other than the R.A.F. Medical Stores Depot at Hartlebury) and at dental centres, equipment held on charge in the medical and dental ledgers will be indicated as Class "A", "B" or "C" as follows:—

1. *Class "A" equipment* (e.g. surgical instruments) is non-expendable. When reconditioning can no longer make "A" class equipment serviceable, it is normally disposed of by a Board of Survey or by return to the Medical Stores Depot in accordance with the instructions of the competent medical authority.

2. *Class "B" equipment* (e.g. rubber tubing, clinical thermometers) is expendable, and "struck off" charge, when no longer serviceable, on a medical officer certifying that it has been consumed in fair wear and tear (but see para 376, clause 3).

3. *Class "C" equipment* (e.g. bandages and drugs) is expendable. (For detail see para. 376.)

368. Method of Demanding.—1. *In the United Kingdom.*—(a) The full address of the station will always be given in the appropriate space on the form, and not merely the number of the squadron or description of the unit.

(b) Medical and dental equipment for use by hospitals and stations will be demanded six-monthly on Form 1209, according to the estimated requirements for the ensuing six months. Demands from stations will be framed in accordance with the scales laid down in A.P. 132. Where it is considered necessary to demand articles in excess of the scale, or not included therein, full reasons will be given; and unless such items are endorsed by the competent medical authority, they will be disregarded by the issuing authority.

(c) The various articles required will be divided into sections corresponding to those contained in A.P. 132, separate sheets being used for each section. The quantities remaining on charge will invariably be shown in the appropriate column on the form.

(d) In the case of "A" class equipment (*see* para. 367, clause 1) demands will show whether articles of similar type but different pattern are held on charge, and also if they are in a serviceable condition.

(e) Demands for electrical apparatus will be accompanied by a statement showing particulars of the electric power supply, *i.e.* whether "AC" or "DC" and voltage. The local Works Officer will be consulted whenever it is proposed to install electrical equipment of large size.

(f) Demands to supplement the quarterly indents will be avoided as far as possible.

(g) The strictest economy will be exercised in the demanding and use of equipment. All officers concerned will satisfy themselves that only such articles and quantities as are actually needed are demanded and, in the case of expensive items, that the expense is justified and that no less expensive articles will suffice.

(h) Except as provided in para. 369, demands in triplicate will be forwarded to the competent medical authority, who will scrutinize and forward them to the Air Ministry with his remarks as to the necessity for demanding any article which is not included in the scale.

2. *Abroad.*—(a) Units abroad will, as a general rule, obtain supplies of medical and dental equipment from the United Kingdom, and clause 1 will apply. These demands will be rendered quarterly, unless otherwise approved.

(b) In commands where it is found impracticable to obtain equipment in this manner, it will be requisitioned from the most suitable naval or army source, as the competent medical authority may direct. Equipment thus obtained will be on repayment, and a copy of the issuing authority's voucher will be kept to support the entry in the ledger.

369. Calf Lymph, Sera and Vaccines.—1. *In the United Kingdom.*—(a) *Calf lymph.*—Demands for calf lymph will be sent to the Director, Government Lymph Establishment, Colindale Avenue, The Hyde, N.W.9 (see para. 372, clause 4).

(b) *Vaccines.*—Demands for the following vaccines will be sent to the Commandant, Royal Army Medical College, Millbank, London, S.W.1 :—

Anti-acne.	Anti-pneumococcus.
Anti-acne and staphylococcus.	Anti-staphylococcus.
Anti-bacillus coli.	Anti-streptococcus.
Anti-cholera.	Anti-T.A.B.
Anti-influenza and catarrh	Anti-T.A.B.C.
mixed.	Anti-whooping cough.

All other vaccines will be demanded as directed in para. 368, clause 1 (h).

(c) *Sera.*—Demands for sera will be sent to the Officer Commanding, R.A.F. Institute of Pathology and Tropical Medicine, Halton.

2. *Demand procedure.*—In each case Form 1209 will be used, the original copy being forwarded to the source of supply and the duplicate (showing the date on which the supply was demanded) to the competent medical authority, for transmission to Air Ministry. In the case of demands for calf lymph, the duplicate copy will not be forwarded until the lymph has been received and the form has been endorsed with the date of receipt and the receipt voucher number.

3. *Abroad.*—At stations overseas vaccines and sera will normally be obtained locally; if however there is no suitable local source, demands will be forwarded to Air Ministry.

4. *Stock.*—Sera and vaccines will not be stocked in large quantities, and as far as possible should only be demanded as required.

370. Local Purchase.—1. *General.*—Except in extreme urgency, purchases of medical and dental equipment will not be made locally without the sanction of the competent medical authority.

2. *Authority.*—A medical or dental officer who makes such purchases will apply at once for covering authority, stating fully the grounds for treating the matter as urgent.

3. *Monthly return by Competent Medical Authority.*—Competent medical authorities will forward monthly to the Air Ministry a statement of such purchases, giving particulars of the unit concerned, the articles purchased, the amount involved, the source of supply and the number and date of the relative receipt voucher. A nil return will be rendered when no purchases have been made.

4. *Unit accounting procedure.*—Whenever possible, the supplier's invoice will be obtained, or, if no invoice is available, a list of the articles purchased will be made on Form 600 and signed by the medical officer to support the entry in Form 823.

5. *Payment.*—Payment of the tradesman's claim, normally rendered on Form 666, will be made through the cash account of the unit.

371. Discrepancies found on Unpacking.—1. *Supervision of unpacking.*—Medical or dental equipment received by units will be unpacked in the presence of a medical or dental officer or medical quartermaster, who will note discrepancies (including breakages or damage), at the time of unpacking.

2. *Action by consignee.*—(a) When a discrepancy is found to exist between the quantities received and the quantities shown on the voucher relating thereto, the consignee will prepare forthwith a discrepancy report on Form 594 in triplicate, stating the condition of the package on receipt, the time which elapsed between receipt and unpacking of the consignment, and any other particulars bearing on the matter. Where necessary, the consignee will inform the railway company or carrier delivering the goods of the loss or damage immediately this is ascertained. (For procedure, see K.R. & A.C.I., para. 2465 *et seq.*)

(b) The original and duplicate copies of the discrepancy report will be forwarded through the usual channels to the consignor, attached to the issue voucher (Form 600 or 712A). The triplicate copy will be retained in the book. If, however, the consignor is a contractor, the report will be passed through the competent medical authority to the Air Ministry (M.A.3).

(c) A note will be made on both copies of the issue voucher against the item or items concerned, stating the actual quantity received and brought on charge. A reference to the discrepancy report will be inserted on the issue voucher, but the consignor's original figures will not be altered.

3. *Action by consignor.*—(a) On receipt of the discrepancy report the consignor will cause immediate inquiry to be made regarding the discrepancy, and will take such other action as he may consider advisable; if necessary, the stock will be verified. *A reply will be sent to the consignee within seven days for action as in clause 2 (a) above if necessary.*

(b) *Discrepancy admitted.*—If the discrepancy is admitted, the consignor will, if necessary, adjust the discrepancy in his account by certificate voucher (Form 600—one copy), attaching the duplicate copy of the discrepancy report in support of the adjustment. The certificate voucher and issue voucher

number will be cross-referred. The certificate voucher number will be shown on both copies of the discrepancy report, and the original copy of the report will be endorsed "Discrepancy admitted" and returned to the consignee, who will attach it to the relative receipt voucher.

(c) *Discrepancy not admitted.*—If the consignor does not admit responsibility for the deficiency after investigation has been made by both parties, a report of the matter, with copies of all correspondence relating thereto, will be referred by the consignor to the competent medical authority for action in accordance with K.R. & A.C.I., para. 1646, clause 4.

4. *Write-off action.*—If "write-off" action, on Form 1230, is authorized by the Air Ministry, a further issue, if necessary, will be made to cover the loss and a new Form 712 supplied. The discrepancy report will be endorsed accordingly. The consignee's copy of the discrepancy report will then be attached to the relevant Form 712.

Note.—As a general rule the duty of investigating losses and, where necessary, obtaining authority for writing off the lost equipment, rests with the consignor, but the consignee is responsible for furnishing him with all information available, and for notifying, if necessary, the railway company or carrier delivering the goods of the loss or damage immediately this is ascertained. Only when the loss has obviously occurred at the consignee's end is it incumbent upon the latter to take the necessary action.

372. Receipt without Vouchers.—1. If a consignment of equipment is received without vouchers, a temporary voucher will be made out, enumerating all the articles and packages in detail. This voucher will be given the next number in the series (*see* para. 374, clause 4) and will enable the equipment to be taken on charge without delay.

2. When the correct voucher is received, it will be given the same number as, and will be filed away with, the temporary voucher, no ledger transaction being required.

3. If no voucher is received within a reasonable period, the fact will be reported to the competent medical authority.

4. A certificate receipt voucher on Form 1209 will always be made out for a delivery of calf lymph, which is never invoiced by the supplying department. This does not apply to local purchases overseas which will be dealt with as in para. 370.

373. Complaints.—1. Objections as to age, adulteration, etc., of drugs and inferior quality or defective workmanship of surgical instruments, etc., will be referred to the Air Ministry, through the competent medical authority.

2. Drugs supplied by different firms should be kept in separate containers as far as possible so that, should complaint be made as to quality or quantity, no difficulty will arise in ascertaining the source of supply.

374. Accounts to be Kept and Method.—1. *General.*—All medical and dental establishments, including training camps and transports, will maintain ledger accounts on Form 823, separate ledgers being kept for medical and dental equipment.

2. *Arrangement of Forms.*—One item will be inserted on each form and the Forms will be arranged in alphabetical order, by sections, and kept in binders (Form 4003).

3. (a) *Entries on Forms.*—These accounts will show :—

- (i) Items brought forward from the previous account.
- (ii) Receipts and issues made during the current period.
- (iii) Balances remaining.
- (iv) Whether class “ A ”, “ B ” or “ C ” equipment.

(b) *Support of entries by vouchers.*—The entries (apart from those representing the expenditure of medical equipment during the period) will be supported by the duplicate copies of the vouchers for equipment received, certificates of loss or damage, certificates of issue of surgical appliances, receipts for articles issued to other units, and any other vouchers relating to transactions recorded in the ledgers.

(c) *Surgical appliances.*—In accounting for surgical appliances, Form 415 will be used as a certificate issue voucher, and each type of appliance will be entered on a separate form unless the total number of issues is so small that they can be shown on one copy.

(d) *Composite articles of equipment.*—When components have been demanded in order to complete composite articles to a revised scale they will, on receipt, be taken on charge under their respective headings and issued on a Certificate Issue Voucher to complete the composite article to the revised scale, the voucher being endorsed to that effect.

4. *Numbering of vouchers.*—Vouchers will be numbered consecutively, according to the date of receipt of the equipment, in the space provided, fresh series of numbers being commenced for receipt, issue and conversion vouchers in each accounting period. These numbers will be quoted in the appropriate space on all such vouchers.

5. *Armament training camps and hired transports.*—Medical and dental equipment at armament training camps and on transports will be accounted for as at units other than hospitals, but when the camp is closed, or at the end of the trooping

season, all medical and dental equipment will be returned to store, and the ledgers closed and forwarded with all relevant vouchers to the parent unit in the case of training camps, and to the Air Ministry in the case of transports.

6. *Hospitals*.—(a) In hospitals and similar large establishments, issues of class "A" and "B" equipment will be made on Form 674, and recorded on Forms 37 and 670. Exchanges will be made on Form 673 and returns to store on Form 675.

(b) "C" class equipment kept to meet current requirements in the dispensary (apart from those drugs scheduled under the Dangerous Drugs Acts, 1933) and dental centre will not be held on ledger charge. These items will be replenished by demand on Form 674. The quantities so issued from the medical store will be written off ledger charge as the issues occur, the demands forming the supporting issue vouchers.

7. *Dangerous drugs*.—The method of accounting for dangerous drugs will be found in para. 378.

8. *Alterations in ledgers*.—All alterations in ledgers and vouchers will be made in red ink and initialled by the officer responsible for the account.

9. *Audit*.—The accounts will normally be audited by the Air Ministry auditors at the same time as the other R.A.F. equipment accounts.

10. *"Dead" ledger sheets and vouchers*.—When the last items on closed ledger sheets have been audited, the "dead sheets" will be parcelled, by years, and kept for disposal as directed by para. 350. After audit, vouchers will be treated in a similar manner.

375. Weights and Measures, Conversion.—1. *Solid drugs*.—(a) When solid drugs are issued by contractors or medical stores depots, they are normally in avoirdupois scale, and it will therefore be necessary to convert them to the apothecaries' scale before they are taken on charge.

Note.—One ounce avoirdupois = 437·5 grains.

One ounce apothecaries' = 480·0 grains.

(For table of conversions see A.P. 132, Appendix I.)

(b) Drugs supplied in terms of grammes will be converted to grains by the metric system, *i.e.*, one gramme = 15·4 grains (see A.P. 132, Appendix I).

2. *Fluid drugs*.—If necessary, fluid drugs, before being taken on charge, will be actually measured and converted to the scale in which the drug is usually dispensed. Conversion will be effected on Form 21.

3. *Hypodermic and ophthalmic tablets.*—Hypodermic and ophthalmic tablets issued in tubes from the R.A.F. Medical Stores Depot at Kidbrooke, whether as separate items or as components (*e.g.*, of hypodermic cases), will be invoiced in such a manner as to show the number of tubes and the number of tablets contained in each tube. Medical and dental officers will take all such tablets on charge by number. (With regard to Mobilization equipment *see* para. 412.)

376. "A" and "B" Class Equipment—Strike-Off Procedure.—1. "A" class equipment.—For the "write-off" or "strike-off" of class "A" equipment on Form 1230 *see* K.R. & A.C.I., paras. 1646 and 1647.

2. "B" class equipment.—Certain articles which are liable to become unserviceable through constant use (*i.e.* "B" class equipment) may be regarded as expendable, but the expenditure thereof will be supported in the ledger by a certificate specifying the articles in detail and stating that they have become unserviceable :—

(a) by fair wear and tear ;

(b) through circumstances which do not involve wilful damage or neglect of reasonable precautions.

Whenever stocktakings are carried out by medical units (including hospitals) in accordance with para. 389, these certificates will be forwarded to the competent medical authority, who, if he considers any of the articles are not expendable (*i.e.* "A" equipment), will give instructions for their strike-off on Form 1230. Form 1230 action will also be taken in respect of any "B" class equipment rendered unserviceable in circumstances in which these certificates are not applicable (*see* K.R. & A.C.I., para. 1646).

3. *Equipment priced one shilling and sixpence or less.*—Other small fragile articles of glass or earthenware, not exceeding one shilling and sixpence in value, which are duly certified to have been rendered unserviceable in use through circumstances which do not involve wilful damage or neglect of reasonable precautions, *e.g.* :—

Beakers.

Syringes, urethral.

Bottles (8 oz. and under).

Thermometers, clinical.

Rods, glass, stirring.

Tubes, test.

may be struck off in accordance with 2 (b) above.

4. "C" class equipment, When this is expended, it is shown as such in the medical equipment account on stocktaking (*see* para. 389, clause 2).

5. *Composite equipment.*—(a) When a Class "A," "B" or "C" component part of a composite article of equipment becomes unserviceable, deficient or expended, it will be

written off charge by means of a Form 1230, Fair Wear and Tear Certificate or Form 600 (blue copy) as applicable. The accounting procedure will be as follows:—

(i) *Class "A" stores.*—The composite equipment will be converted (Form 21 being used in duplicate) to "repairable" in the following manner:—

To be written off charge : Companion, Field Medical, complete No. 1

To be brought on charge : Companion, Field Medical, repairable (1 Dredger, boric acid, deficient) .. No. 1

Form 1230 will then be used to write off charge the damaged or deficient dredger, and a new article will be demanded or issued from stock if available. When a special demand is necessary, the new article will be brought on charge as such, on receipt. The "repairable" Companion, together with the article in replacement, will be converted (Form 21 being used in duplicate) to a complete Companion, the procedure being a reversal of the action previously employed, *e.g.* :—

To be written off charge : Companion, Field Medical, repairable (1 Dredger, boric acid, deficient) .. No. 1
Dredger, boric acid .. No. 1

To be brought on charge : Companion, Field Medical, complete No. 1

(ii) *Class "B" stores.*—Deficient or unserviceable articles will be replaced from stock or by demand without conversion of the composite article of equipment to a "repairable" item. Unserviceable articles which have been replaced will be taken into stock and then struck off charge by Fair Wear and Tear Certificate—unless the deficiency or unserviceability is due to a cause other than normal use or expenditure, in which case Form 1230 action will be taken.

(iii) *Class "C" stores.*—The procedure will be similar to that for Class "B" stores, except that Form 600 (blue copy) will be used to strike off charge the deficient or unserviceable item in place of a Fair Wear and Tear Certificate, unless Form 1230 action is required. Forms 600 used for the replacement of Class "C" stores will be endorsed "Issued to replace items consumed from. (e.g. Companion, Field Medical)" and a copy of any Form 1230 raised in conjunction with such an issue will be attached thereto.

(b) It is essential that all conversion Issue or Receipt vouchers in respect of Class "A" medical or dental equipment be passed to the competent medical authority for notation on the appropriate Form 670 (*see* para. 377).

377. Record of "A" Class Equipment held by Competent Medical Authority.—1. A record of "A" class equipment (both medical and dental) will be kept by the competent medical authority on Form 670 for each medical or dental ledger account (other than for hospitals, the Central Medical Establishment or the R.A.F. Institute of Pathology and Tropical Medicine) in the command, and all receipt, issue, conversion, loss, damage or deficiency transactions in respect of these particular items will be duly recorded by him on the appropriate Form 670 in the following manner:—

(a) A total of ten items may be recorded on each side of Form 670.

(b) The columns "Issued to Flight" and "Ret'd to Store" will be marked "R" and "I" respectively, all records of receipt being noted in the former and of other transactions in the latter.

(c) The relative unit receipt or issue voucher number will be entered on the corresponding line in the column "Voucher No." thus:—R.V.3. or I.V.2.

(d) Indents from units will invariably be compared with the relative Forms 670 in order to ascertain that excessive quantities of items are not being demanded.

(e) When there has been any transaction, a line will be drawn in ink below the last entry in Form 670 on completion of stocktaking at the unit concerned.

2. For purposes of audit, the relative copy of Form 670 may be called for when the accounts at a unit are under examination, and on such occasions the form will be sent by registered post direct to the auditors.

378. Dangerous Drugs and Poisons, Accounting Procedure.—

1. *Checking on receipt.*—Supplies of dangerous drugs and poisons will be checked on receipt, as to quantity and condition, by the quartermaster or his representative on behalf of the commanding officer at a hospital, by the medical officer of a sick quarters or medical establishment other than a hospital, or by the dental officer of a dental centre.

2. *Medical Stores depots.*—Stocks held in the medical store of a hospital will be accounted for on Form 823 and issued in the weights or measures in which they are received from the contractors.

3. *Dangerous Drugs Ledger*.—(a) A special ledger (on Form 823), to be known as the "Dangerous Drugs Ledger", will be maintained in each hospital dispensary to account for dangerous drugs received from the medical store. Only one type of drug will be entered on each sheet of the ledger.

(b) Drugs will be demanded on Form 674, the triplicate copy of which (after comparison with the copy on which the issue is made) will act as a receipt voucher. A separate form will be completed for each dangerous drug demanded and brought on charge.

(c) The senior dispenser employed on dispensing duties will be responsible for keeping the Dangerous Drugs Ledger.

4. *Dangerous Drugs Issue Book*.—(a) C.Os. of hospitals and officers in charge of medical and dental establishments will be responsible that a "Dangerous Drugs Issue Book" (Form) is kept, and that all issues of the drugs scheduled in the Dangerous Drugs Acts, 1933, and listed in para. 379, are recorded in it in order to comply with the regulations published under those Acts.

(b) Dangerous drugs issued in sterile rubber capped bottles (e.g. local anaesthetics) will only be recorded when the complete bottle has been expended.

(c) At hospitals, this book will be maintained in the dispensary, and the senior dispenser employed on dispensing duties will be responsible that the issues are correctly recorded. A separate book will be kept in the Dental Centre and the dental officer in charge will be responsible for its completion.

(d) The record of issues of dangerous drugs will be made under the following headings :—

Serial Number of Issue.*	Date of Issue.	Name of Drug.	Quantity of Drug Issued.	To whom Issued.†	Address of Patient, Ward or Depart- ment.‡	Signature of Officer or Dispenser.

* Commences from 1st January of each year.

† Enter name of patient, or stock mixture.

‡ Ward or department refers only to hospitals.

(e) Each entry in the Dangerous Drugs Issue Book will be made in ink immediately on issue of the drug, and no entry may be cancelled, obliterated or altered. Mistakes will be corrected by a footnote giving the correct particulars and the date of the correction.

5. *Checking of stock.*—The C.O. of a hospital or his representative will check the stock both in the medical store and in the dispensary, at intervals not exceeding three months. Any irregularity or deficiency discovered will be reported immediately to the competent medical authority. Similarly the competent medical authority will arrange for a quarterly inspection of the stock in sick quarters and medical establishments (other than hospitals).

6. *Discrepancies found on stocktaking.*—On stocktaking, if trifling discrepancies between quantities on charge actually held are revealed to be entirely due to unavoidable wastage or errors in measuring or weighing, the necessary adjustments will be made by writing the quantity shown as deficient off charge on a certificate issue voucher. This voucher will be certified by the medical officer carrying out the stocktaking, and two copies will accompany the statement of expenditure of dangerous drugs and poisons to the competent medical authority. The ledgers will be adjusted at the same time.

7. *Records of issues.*—The record of issues, together with the prescriptions (Forms 836) supporting the issues, will be kept in safe custody for a period of two years after the date of the last entry, and will be held available for inspection by the competent authorities.

379. Schedule of Dangerous Drugs and Exceptions.—

1. *Dangerous Drugs.*—The following are scheduled as dangerous drugs under the Dangerous Drugs Acts, 1933 :—

- (a) Medicinal opium ;
- (b) Extracts and tinctures of Indian hemp ;
- (c) Morphine, the esters of morphine, diacetylmorphine (commonly known as diamorphine or heroin), cocaine, ecgonine, the esters of ecgonine and their respective salts ;
- (d) Dihydrohydroxycodeinone (" Eucodal "), dihydrocodeinone (" Dicodide "), dihydromorphinone (" Dilauidide "), acetyldihydrocodeinone (" Acedicone "), dihydromorphine (" Paramorfan "), their esters and the salts of any of these substances and of their esters ;
- (e) Morphine-N-oxide (commonly known as genomorphine), the morphine-N-oxide derivatives, and any other pentavalent nitrogen morphine derivatives ;

(f) Any preparation, admixture, extract or other substance containing any proportion of diacetylmorphine or not less than one-fifth per cent. of morphine or not less than one-tenth per cent. of cocaine or ecgonine ;

(g) Thebaine and its salts, and (with the exception of methylmorphine, commonly known as codeine, and ethylmorphine, commonly known as dionin, and their respective salts) benzylmorphine and the other ethers of morphine and their respective salts ;

(h) Any preparation, admixture, extract or other substance containing any proportion of any of the substances mentioned in clauses (d), (e) or (g) of this paragraph.

The expression "ecgonine" means laevo-ecgonine, and includes any derivatives of ecgonine from which it may be recovered industrially. The percentage in the case of morphine will be calculated as in respect of anhydrous morphine.

2. *Exceptions.*—The regulations do not apply to the following preparations :—

Cereoli Iodoformi et Morphinæ	..	..	B.P.C.
Emplastrum Opii	..	..	B.P., 1898.
Linimentum Opii	..	..	B.P., 1914.
Linimentum Opii Ammoniatum	..	..	B.P.C.
Pasta Arsenicalis	..	..	B.P.C.
Pilulæ Hydrargyri cum Opio	..	..	B.P.C.
Pilulæ Ipecacuanhæ cum Scilla	..	..	B.P., 1914.
Pilulæ Plumbi cum Opio	..	..	B.P., 1914.
Pilulæ Digitalis et Opii Compositæ	..	..	B.P.C.
Pilulæ Hydrargyri cum Creta et Opio	..	..	B.P.C.
Pulvis Cretæ Aromaticus cum Opio	..	..	B.P., 1932.
Pulvis Ipecacuanhæ compositus	..	..	B.P., 1914.
Pulvis Ipecacuanhæ et Opii	..	..	B.P., 1932.
Pulvis Kino Compositus	..	..	B.P., 1914.
Suppositorium Plumbi Compositus	..	..	B.P., 1914.
Suppositorium Plumbi cum Opio	..	..	B.P., 1932.
Tablettæ Plumbi cum Opio	..	..	B.P.C.
Unguentum Gallæ cum Opio	..	..	B.P., 1914.
Unguentum Gallæ Compositus	..	..	B.P.C.
Elixir Diamorphinæ et Terpini cum Apomorphina	..	..	B.P.C.
Linctus Diamorphinæ Camphoratus	..	..	B.P.C.
Linctus Diamorphinæ cum Ipecacuanha	..	..	B.P.C.
Linctus Diamorphinæ et Scillæ	..	..	B.P.C.
Linctus Diamorphinæ et Thymi	..	..	B.P.C.

Mixtures of Emplastrum Opii, B.P., 1898, with other plasters of the B.P., 1914 and 1932, and of the B.P.C.

Mixtures of Linimentum Opii, B.P., 1914, with other liniments of the B.P., 1914 and 1932, and of the B.P.C.

Mixtures of Linimentum Opii Ammoniatum, B.P.C., with other liniments of the B.P., 1914 and 1932, and of the B.P.C.

Mixtures of Pulvis Ipecacuanhæ Compositus, B.P., 1914, and of Pulvis Ipecacuanhæ et Opii, B.P., 1932, with any of the following: Hydrargyrum cum Creta, B.P., 1914 and 1932; Acidum Acetylsalicylicum, Phenacetinum, Quinina and its Salts; Sodii Bicarbonas.

Mixtures of Unguentum Gallæ cum Opio, B.P., 1914, and of Unguentum Gallæ Compositum, B.P.C., with other ointments and plasters of the B.P., 1914 and 1932, and of the B.P.C.

380. Schedule of Poisons.—1. Items of medical equipment deemed to be "Poisons" within the meaning of the Pharmacy and Poisons Act, 1933, and subsequent Statutory Rules and Orders amending that Act, are detailed below:—

SECTION I.

Alkaloids, the following; their salts, simple or complex:—

*Acetyldihydrocodeinone.

Aconite, alkaloids of, except substances containing less than 0·02 per cent. of the alkaloids of aconite.

Apomorphine except substances containing less than 0·2 per cent. of apomorphine.

Atropine except substances containing less than 0·15 per cent. of atropine.

Belladonna, alkaloids of, except substances containing less than 0·15 per cent. of the alkaloids of belladonna calculated as hyoscyamine.

*Benzoylmorphine.

*Benzylmorphine.

Brucine except substances containing less than 0·2 per cent. of brucine.

Calabar bean, alkaloids of.

*Coca, alkaloids of, except substances containing less than 0·1 per cent. of the alkaloids of coca.

*Cocaine except substances containing less than 0·1 per cent. of cocaine.

Codeine except substances containing less than 1 per cent. of codeine.

Colchicine except substances containing less than 0·5 per cent. of colchicine.

Coniine except substances containing less than 0·1 per cent. of coniine.

* These poisons are also subject to the additional restrictions under the Dangerous Drugs Acts (*see* para. 379, clause 1).

Cotarnine except substances containing less than 0·2 per cent. of cotarnine.

Curarine.

*Diacetylmorphine.

*Dihydrocodeinone.

*Dihydrohydroxycodine.

*Dihydromorphine.

*Dihydromorphinone.

*Ecgonine, except substances containing less than 0·1 per cent. of ecgonine.

Emetine except substances containing less than 1 per cent. of emetine.

Ergot, alkaloids of.

*Ethylmorphine except substances containing less than 0·2 per cent. of ethylmorphine.

Gelsemium, alkaloids of, except substances containing less than 0·1 per cent. of the alkaloids of gelsemium.

Homatropine except substances containing less than 0·15 per cent. of homatropine.

Hyoscine except substances containing less than 0·15 per cent. of hyoscine.

Hyoscyamine except substances containing less than 0·15 per cent. of hyoscyamine.

Jaborandi, alkaloids of, except substances containing less than 0·5 per cent. of the alkaloids of jaborandi.

Lobelia, alkaloids of, except substances containing less than 0·5 per cent. of the alkaloids of lobelia.

*Morphine except substances containing less than 0·2 per cent. of morphine calculated as anhydrous morphine.

Nicotine.

Papaverine except substances containing less than 1 per cent. of papaverine.

Pomegranate, alkaloids of, except substances containing less than 0·5 per cent. of the alkaloids of pomegranate.

Quebracho, alkaloids of.

Sabadilla, alkaloids of, except substances containing less than 1 per cent. of the alkaloids of sabadilla.

Solanaceous alkaloids, not otherwise included in this schedule except substances containing less than 0·15 per cent. of solanaceous alkaloids calculated as hyoscyamine.

Stavesacre, alkaloids of, except substances containing less than 0·2 per cent. of the alkaloids of stavesacre.

Strychnine except substances containing less than 0·2 per cent. of strychnine.

* These poisons are also subject to the additional restrictions under the Dangerous Drugs Acts (*see* para. 379, clause 1).

- Thebaine except substances containing less than 1 per cent. of thebaine.
- Veratrum, alkaloids of, except substances containing less than 1 per cent. of the alkaloids of veratrum.
- Yohimba, alkaloids of.
- Allylisopropulacetylurea.
- Amidopyrine; its salts.
- Amino-alcohols, esterified with benzoic acid, phenylacetic acid, phenylpropionic acid, cinnamic acid or the derivatives of these acids, except in substances containing less than 10 per cent. of esterified amino-alcohols.
- Antimonial poisons except substances containing less than the equivalent of 1 per cent. of antimony trioxide.
- Arsenical poisons except substances containing less than the equivalent of 0.01 per cent. of arsenic trioxide.
- Barbituric acid; its salts; derivatives of barbituric acid; their salts; compounds of barbituric acid, its salts; its derivatives; their salts, with any other substance.
- Barium, salts of, except barium sulphate.
- *Cannabis; the resin of cannabis; extracts of cannabis; tinctures of cannabis; cannabin tannate.
- Cantharidin except substances containing less than 0.01 per cent. of cantharidin.
- Cantharidates except substances containing less than the equivalent of 0.01 per cent. of cantharidin.
- Chloroform except substances containing less than 10 per cent. of chloroform.
- Digitalis, glycosides of, except substances containing less than one unit of activity (as defined in the British Pharmacopœia) in two grammes of the substance.
- Dinitrocresols; dinitronaphthols; dinitrophenols; dinitrothymols.
- Ergot; extracts of ergot; tinctures of ergot.
- Guanidines, the following:—
polymethylene diguanidines
dipara-anisylphenetyle guanidine.
- Hydrocyanic acid, except substances containing less than 0.1 per cent. of hydrocyanic acid (HCN); cyanides except substances containing less than the equivalent of 0.1 per cent., weight in weight, of hydrocyanic acid (HCN); double cyanides of mercury and zinc.
- Lead, compounds of, with acids from fixed oils.

* These poisons are also subject to the additional restrictions under the Dangerous Drugs Acts (*see* para. 379, clause 1).

Mercuric chloride except substances containing less than 1 per cent. of mercuric chloride ; mercuric iodide except substances containing less than 2 per cent. of mercuric iodide ; nitrates of mercury except substances containing less than the equivalent of 3 per cent., weight in weight, of mercury (Hg) ; potassio-mercuric iodides except substances containing less than the equivalent of 1 per cent. of mercuric iodide ; organic compounds of mercury except substances containing less than the equivalent of 0.2 per cent., weight in weight, of mercury (Hg).

Metanitrophenol ; orthonitrophenol ; paranitrophenol.
Nux Vomica except substances containing less than 0.2 per cent. of strychnine.

Opium except substances containing less than 0.2 per cent. of morphine calculated as anhydrous morphine.

Ouabain.

Oxycinchonic acid, derivatives of ; their salts ; their esters.

Phenetidylphenacetin.

Phenylcinchoninic acid ; salicyl-cinchonic acid ; their salts ; their esters.

Phenylethylhydantoin ; their salts ; its acyl derivatives ; their salts.

Picrotoxin.

Savin, oil of.

Strophanthus, glycosides of.

Thallium, salts of.

Tribromethyl alcohol.

SECTION II

Acetanilide ; alkyl acetanilides.

Ammonia except substances not being solutions of ammonia or preparations containing solutions of ammonia ; liquids containing less than 5 per cent., weight in weight, of ammonia (NH_3) ; refrigerators ; smelling bottles.

Formaldehyde except substances containing less than 5 per cent., weight in weight, of formaldehyde ($\text{H}\cdot\text{CHO}$) ; photographic glazing or hardening solutions.

Hydrochloric acid except substances containing less than 9 per cent., weight in weight, of hydrochloric acid (HCl).

Lead acetate except substances containing less than 4 per cent. of lead acetate.

Nitric acid except substances containing less than 9 per cent., weight in weight, of nitric acid (HNO_3).

Nitrobenzene except substances containing less than 0.1 per cent. of nitrobenzene ; soaps containing less than 1 per cent. of nitrobenzene.

Phenols except :

- Caevacrol ;
- coal tar, crude or refined ;
- creosote obtained from coal tar ;
- essential oils in which phenols occur naturally ;
- medicines containing less than 1 per cent. of phenols ;
- nasal sprays, mouthwashes, pastilles, lozenges, capsules ;
- pessaries, ointments, or suppositories containing less than 2.5 per cent. of phenols ;
- smelling bottles ;
- soaps for washing ;
- solid substances containing less than 60 per cent. of phenols ;
- tertiary butyl-cresol ;
- thymol.

Phenylene diamines ; toluene diamines ; their salts.

Picric acid except substances containing less than 5 per cent. of picric acid.

Potassium hydroxide except substances containing less than 12 per cent. of potassium hydroxide.

Sodium fluoride except substances containing less than 3 per cent. of sodium fluoride as a preservative.

Sodium hydroxide except substances containing less than 12 per cent. of sodium hydroxide.

Sodium silicofluoride except substances containing less than 3 per cent. of sodium silicofluoride as a preservative.

Sulphuric acid except substances containing less than 9 per cent., weight in weight, of sulphuric acid (H_2SO_4) ; accumulators ; batteries ; fire extinguishers.

2. All other preparations or admixtures which are not included in Part I of this schedule and which contain a poison within the meaning of the Poisons and Pharmacy Act.

381. Custody of Dangerous Drugs and Poisons and of Poison Cupboard Keys.—1. *At hospitals.*—(a) *Medical store.*—Dangerous drugs and poisons held in the medical store will be kept under lock and key in a room or cupboard set apart for dangerous articles. Arrangements will be made by the C.O. of the hospital to ensure that no unauthorised person obtains possession of the key of this room or cupboard or access to the contents.

(b) *Dispensary.*—

(i) Dangerous drugs and poisons maintained in the dispensary will be kept under lock and key in a cupboard to be known as the "Poison Cupboard". Only dangerous drugs and poisons will be kept in the poison cupboard.

(ii) During working hours, the key of the cupboard will be retained on the person of the senior dispenser on duty, who will be responsible for its safe custody.

(iii) The key will be personally handed over from one dispenser to another, or in non-working hours if no dispenser is on duty, to the orderly medical officer who will retain the key in his custody until the resumption of working hours.

(c) *Wards and special departments.*—

(i) Stock preparations containing dangerous drugs and poisons required to be retained in a ward or special department, including the out-patients' department, will be kept in a locked cupboard, and the key in the possession of the medical officer, or nursing sister in charge of the ward. Issues will only be made in accordance with the directions of a medical officer.

(ii) Medicines containing dangerous drugs and poisons supplied for individual patients on prescriptions will be kept in the locked cupboard in the ward or special department in a similar manner. Dangerous drugs and poisons only will be kept in this cupboard.

2. *At medical establishments other than hospitals, and at dental establishments.*—(a) Dangerous drugs and poisons will be stored under lock and key in a cupboard to be known as the "Poison Cupboard". Dangerous drugs and poisons only will be kept in this cupboard.

(b) Normally, the key of the poison cupboard will be retained personally by the medical or dental officer in charge, but at medical establishments where an airman qualified as a dispenser is posted for duty, the key may be handed over to him, to enable him to carry out dispensing duties.

(c) During non-working hours, the key will be in the possession of the medical officer on duty, if any; otherwise it will be retained by the medical officer in charge.

3. *At medical establishments where a civilian medical practitioner is temporarily in charge.*—The key of the poison cupboard will be retained on the person of the senior medical N.C.O. who, in these circumstances, will hold the medical and surgical equipment on charge. If he leaves the station for any reason, he will hand in the key to the guard room for safe custody during his absence. The key will only be withdrawn from the guard room on the personal application of the medical N.C.O., or on the written or personal application of the duty medical orderly when the key is required for the use of the civilian medical practitioner.

4. *Stocking of dangerous drugs in excess of requirements.*—In the dispensary of a hospital or in a sick quarters or dental centre, dangerous drugs will not be held in excess of actual or anticipated requirements.

382. Prescriptions.—1. *General.*—(a) Medical and dental officers will write, date and sign all prescriptions clearly and legibly, and will specify the number (if any), rank, name and unit of the person for whom the prescription is given, or in the case of a person who is not a member of His Majesty's Forces, his or her full name and address.

(b) They will append specific instructions in English as to the administration of the medicine ordered.

(c) Each "repeat" prescription will be signed or initialled and dated by the prescribing officer.

(d) All original prescriptions and also "repeat" prescriptions will be initialled and dated by the dispenser at the time the issue of the medicine is made.

(e) In the absence of an airman who is a qualified dispenser, the medical officer will be directly responsible for the administration, issue and dispensing of all medicines, lotions, liniments, etc., and for the purpose of these regulations will be included in the term "the dispenser". (See paras. 301 and 302.)

2. *Dangerous Drugs.*—(a) All drugs scheduled under the Dangerous Drugs Acts, 1933, and listed in para. 379, clause 1, will be dispensed and issued only on receipt of a prescription on Form 836 properly completed as in clause 1 above. This instruction refers to all prescriptions containing dangerous drugs, no matter how small the quantity of the drug dispensed, nor the purpose for which it is dispensed, whether it is made up for individual patients or for stock mixtures, etc., or required for use in wards, special or out-patient departments.

(b) The total quantity of the dangerous drug to be dispensed will be endorsed by the dispenser on Form 836 in red ink.

(c) The prescription will be given a serial number by the dispenser, the first prescription in the year commencing 1st January being given the number 1, and the series continued to the end of the year.

(d) The dispenser will retain and file separately the perforated copy of Form 836 containing the record of dangerous drugs prescribed, in order to support the issues of dangerous drugs shown in the "Dangerous Drugs Issue Book" (see para. 378, clause 4).

(e) The serial numbers given by the dispenser to issues in the latter book and to prescriptions on Form 836 will correspond.

(f) A prescription containing dangerous drugs will be dispensed once only.

(g) If a medical officer writes a prescription containing dangerous drugs for his own use, the dispensing and issue will be recorded on the proper forms.

3. Prescriptions by dental officers.—A prescription containing dangerous drugs will only be given by a dental officer for the purpose of dental treatment, and will be marked "For local dental treatment only". Such prescriptions will be dealt with and recorded in the same manner as prescriptions written by medical officers.

383. Dispensing of Dangerous Drugs and Poisons.—All poisons, embrocations, liniments, lotions, liquid antiseptics, and all liquid medicines for external applications will be dispensed in bottles *distinguishable by touch* from ordinary medicine bottles. To each bottle will be affixed a label bearing the words "For external use only" and also a "Poison" label when the preparation issued consists of any of the substances detailed in para. 379, clause 1, or contains a percentage of any such substance greater than the minimum specified in that paragraph.

Nothing in this paragraph shall apply to medicines for internal use, *e.g.* washes, gargles, nasal douches, throat paints. Containers of the type used for poisons will not be used for substances which are not poisons.

384. Care of Medical and Dental Equipment.—1. *Compressed Gases.*—(a) Cylinders containing compressed gases will be kept in a dry cool place and not be exposed to the direct rays of the sun or placed near any heating apparatus.

(b) Oil or grease will not be used on the valves of cylinders.

(c) When cylinders are empty the valves will be closed to avoid contamination of the inside of the cylinder.

2. *Dressings.*—Dressings will be kept in a dry, well-lighted and well-ventilated store. Ravages due to insect pests will be guarded against in tropical and sub-tropical regions. (Spraying with an insecticide will do much to lessen the damage due to these pests, and also continuous turning over of stocks with exposure to light and air.)

3. *Drugs.*—The general principles laid down in "The British Pharmacopœia, 1932" and "The British Pharmaceutical Codex, 1934" will be followed in connection with the storage of drugs.

4. *Early treatment outfits*.—With a view to avoiding chemical urethritis arising from the use of deteriorated E.T. capsules, the following precautions will be taken in warm climates :—

- (a) Capsules will be kept in a cool place.
- (b) They will be issued from store to the E.T. Centre in small quantities and at frequent intervals.
- (c) The period out of store will not exceed one month.
- (d) Unused stocks 12 months old will be destroyed.

5. *Electric accumulators and batteries*.—Electric accumulators and/or batteries fitted to instruments will be removed from the instruments when in storage.

6. *Ishihara Colour Vision Charts*.—(a) In order to reduce the amount of fading to a minimum, every book of Ishihara colour vision charts will be kept inside two black envelopes, the opening of the first, containing the book, to be inserted so as to lie at the bottom of the second envelope. These envelopes will be demanded on Form 1209 but will not be taken on ledger charge.

(b) *In the United Kingdom* units will send their charts to the Central Medical Establishment for examination by the Consultant in Ophthalmology after five years. The Consultant in Ophthalmology will insert, on the pro-forma enclosed in the book of charts, the date on which the charts should again be forwarded for further inspection.

(c) *In commands abroad* competent medical authorities will hold a key copy with which all copies in the command will be compared at intervals of not more than two years. The key copy will be retained for checking purposes only and, when not in use, will be kept in a dark cupboard. It will be compared from time to time with new issues of charts to the command but will not be regarded as accurate for more than six years from the date of issue.

(d) The charts will be kept under lock and key by a medical officer.

7. *Packing cases*.—Wooden cases, in which medical equipment is despatched from the Medical Stores Depot, Hartlebury, are specially made for that purpose and should be damaged as little as possible when being opened. Tools for opening and fastening packing cases are supplied to medical establishments and sick quarters (see A.P. 830, Vol. III, scales O. 29, O. 30, and O. 31).

8. *Rubber articles*.—(a) Small rubber articles will be stored in french chalk and all light excluded. Large articles which cannot be stored in this way will be kept in a cool dark place at an even temperature. Rubber tubing will be stored in coils.

(b) They must not be allowed to come into contact with grease or oil.

(c) When articles of equipment composed of rubber and metal are to be stored, the rubber will be separated from the metal parts where possible.

(d) Rubber articles that have become hard through being kept at a low temperature can usually be rendered pliable by keeping them at a temperature of from 70° to 80° F. for some hours before issuing.

(e) When ice is not available, the storage of rubber articles in paraffin vapour (*i.e.* in an air-tight container over a tray of paraffin) assists in their preservation.

9. *Surgical instruments.*—Surgical instruments and appliances will be stored in a dry room, and plated and stainless steel instruments will be greased and wrapped in paper.

385. Articles Issued, or Returned to Store.—1. Whenever medical or dental equipment is issued from one station to another, or is returned to a medical stores depot, Form 600 in triplicate will be used (*see* para. 280). Form 604 will be used as a packing note, separate copies being inserted in each package.

In preparing issue or receipt vouchers, equipment will be enumerated as far as possible in the order in which it appears in A.P. 132.

2. *Empties.*—(a) *In the United Kingdom.*—

(i) Contractor's bottles, containers (*i.e.* those issued by the Medical Stores Depot, Hartlebury only, and to which are attached contractor's labels and price tickets) and cases received with consignments of medical equipment, will be returned to the Medical Stores Depot, Hartlebury. Only bottles and containers to which are affixed the contractor's labels and price tickets are vouched to units from the Medical Stores Depot, Hartlebury. All other bottles and containers sent out will not be taken on charge and may be used at the unit. Should, however, a unit accumulate more "empties" than are required, they may be returned to Hartlebury, if there is no extra cost to the State. Voucher action will not be necessary.

(ii) All cases specially made for the transport of medical equipment are marked with the letters "M.S.D." and have serial numbers. These numbers will be quoted on the issue voucher (Form 600) returning the equipment to Hartlebury.

(iii) Empty cases returned in the above manner, and packages containing empties, will be marked distinctly on the inside and outside of the package or case "Returned empty from the R.A.F. Station (or Hospital) at . . .".

(iv) Where packing cases are received direct from contractors, and a charge has been made for them, instructions will be given by the Air Ministry for their disposal.

(v) When contractor's packing cases are returned to Hartlebury for disposal, the name of the contractor and the price of the case will be inserted on Form 600.

(vi) Distinguishing marks on cases and price labels on bottles will not be erased.

(vii) Packing material, if in good condition, will be returned with the cases.

(viii) Consignments of empties will be sent through the unit equipment officer, from whom a temporary receipt will be obtained pending the return of Form 600 duly receipted by the O.C., Medical Stores Depot, Hartlebury.

(b) *Abroad*.—Sales of empty bottles, packages and other articles, when necessary, will be made under the orders of the air officer commanding of the command.

3. *Composite articles*.—Each composite article of equipment, when returned to store, will be accompanied by a list of contents in triplicate on which deficiencies, damage and expenditure will be recorded, showing the extent and amount against each item. Certain composite items (*e.g.* panniers) have enclosed with them on issue three printed lists of contents for this purpose. The three copies will be signed and dated by the officer returning the articles. One copy will be placed with each composite article and the two remaining copies will be attached to the vouchers forwarded to the consignee. The consignee will sign and return one copy and retain the other two, filing one with the receipt voucher and retaining one with the article until conversion or completion is effected in store. If further copies of these lists are required, application will be made direct to the Officer Commanding, Medical Stores Depot, Hartlebury.

4. *Articles scheduled as dangerous*.—When it is necessary to despatch articles scheduled as dangerous, they will not be packed with other goods, but will form a separate consignment and be sent by registered post. Application for transport will be made on Form 922, marked in red ink "Dangerous" or "Inflammable", as the case may be (*see* K.R. & A.C.I., paras. 2455 and 2457). (Schedules of dangerous articles are detailed in A.P. 830, Vol. II, Leaflet A.6.)

5. *General*.—When units at home send equipment to the Medical Stores Depot at Hartlebury, the vouchers will not be forwarded until the equipment has actually been despatched. The vouchers will show the "Mode of Conveyance" and "Date of Despatch"; for units abroad this will include the name of the vessel in which the equipment was shipped.

385A. Issues on Repayment.—1. No issue of medical or dental equipment out of the Royal Air Force is to be made without the specific authority of the Air Ministry, unless the issue is in accordance with a general authority. Where the terms of the authority stipulate that payment for the items is to be made "in advance" the issue is not to be made until notification has been received from the Air Ministry or other competent authority that recovery has been effected. Thereafter the issue is to be made and vouched on Form 603, to the ledger copies of which the notification of cash recovery is to be attached.

2. Where the approved terms of issue are "repayment," five copies of Form 603 are to be raised and disposed of as follows :—

One copy to be retained in the unit for ledger action.

Three copies to be forwarded to the consignee, with a request that two copies, duly receipted, be forwarded (a) at home : to the Under-Secretary of State, Air Ministry ; (b) abroad : to the Command Accountant.

One copy to be forwarded direct to the Under-Secretary of State, Air Ministry, for units at home, or to the Command Accountant for units abroad.

A receipted copy will eventually be returned to the issuing unit by the Air Ministry or the Command Accountant endorsed "Noted for recovery," and is to be filed with the ledger copy.

386. Issues on Loan.—1. Medical or dental equipment issued on loan will not be struck off charge in the ledger. Issue vouchers, numbered in the ordinary series but endorsed "Loan record only", will be raised in triplicate, on Forms 600 and 603 for loans inside or outside the R.A.F. respectively, and the issue will be recorded from that voucher in a manuscript Loan Book. Two copies of the voucher will be despatched with the article on loan, with a request that one copy be receipted and returned.

2. On return of the article from loan, a certificate receipt voucher on Form 600, numbered in the ordinary series but endorsed "Loan Record only", will be raised to clear the entry in the Loan Book.

3. The Loan Book, which will be ruled to show voucher number and date, description of loan, person to whom lent, period of loan, and return voucher number and date, will be examined periodically and the necessity for the continuance of any of the loans reviewed.

387. Articles Requiring Repair.—1. *In the United Kingdom.*—When articles require repair a demand will be prepared on

Form 1209 stating the nature of the repairs considered necessary. The demand will be forwarded to the Air Ministry through the competent medical authority.

2. *Abroad*.—In commands abroad, the competent medical authority will make the most economical arrangements possible for the repair of damaged articles. When he considers that suitable arrangements for local repair cannot be made, and that the articles are economically repairable in the United Kingdom (the cost of transport being taken into consideration) they will be vouched on Form 600 to the Medical Stores Depot, Hartlebury, where they will be taken on charge. If replacement of the articles is required, a demand will be rendered on Form 1209, endorsed to the effect that the corresponding repairable articles are being forwarded to Hartlebury. Any items not considered to be worth the cost of repair in the United Kingdom will be brought before a Board of Survey.

3. *Repair by contractors*.—When articles are sent to contractors for repair, the same procedure as for loans will be followed, except that when repaired articles are returned, Form 603 will be replaced by Form 712. Forms 712 and 712A in respect of repairs will not be included in the ordinary sequence of receipt vouchers but in a special sequence of repair vouchers.

4. *Electrical apparatus*.—In cases of failure of electrical apparatus, such as sterilizers or dental engines, the assistance of the local works electrical staff will be obtained in the first place. Spares required for the repair of such apparatus will be requisitioned by the medical officer. If it is found necessary to return the article to the makers, a demand will be forwarded in the usual manner on Form 1209.

388. Disposal of Surplus or Unserviceable Equipment.—

1. *In the United Kingdom*.—A medical or dental officer who wishes to dispose of equipment surplus to requirements will obtain permission from the competent medical authority to forward it to the Medical Stores Depot.

2. Unserviceable surgical and dental instruments which have been submitted to higher authority on Form 1230 or to Board of Survey on Form 681, will be sent to the Medical Stores Depot for final disposal.

3. In vouching such equipment, the procedure detailed in para. 385 will be followed, and unserviceable equipment will be designated as such on the Form 600, in triplicate.

4. *Composite articles*.—When component parts of composite articles become redundant, the items in question will be brought on charge under their respective headings in the ledger

by means of Certificate Receipt Vouchers, Form 600 (red copy) being used for the purpose and endorsed "Item redundant to Scale (A.P. 132 or A.M.O. refers)". If the articles are not required, authority for their return to the Medical Stores Depot will be obtained from the competent medical authority (*see* clause 1).

5. *Abroad*.—Suitable arrangements for the disposal of surplus or unserviceable equipment will be made by the competent medical authority.

389. Stocktaking.—1. *Hospitals*.—(a) Stock at hospitals will be taken annually, not later than the 30th September, Form 33A being used.

(b) On change of C.O. or quartermaster the procedure laid down in A.P. 830, Vol. I, for handing over R.A.F. equipment and the accounts thereof, will be followed.

2. *Medical establishments (other than hospitals), sick quarters and dental establishments*.—(a) Stock at other medical units, sick quarters and dental centres will be taken at intervals of twelve months and also on change of medical or dental officer. In the latter case the next stocktaking will be twelve months from the date on which the new officer took charge.

(b) *Ledgers*.—At stocktaking, the date and balance in hand of each item will be recorded in red ink, space being left for the insertion of balancing entries, which will be made as soon as possible after stocktaking. For expendable items, the balancing entry will normally be represented by the amount expended during the period since the account was last balanced, or by fair wear and tear certificates, as detailed in para. 376; but if the quantity required to balance the account is greater than the amount which has been expended, a Form 1230 will be necessary.

(c) *Stocktaking certificate*.—At the front of the ledger the medical or dental officer will give a certificate as follows :—

"I certify that I have taken stock of all medicines, surgical (or dental) instruments, appliances and materials remaining on hand at this station on the day of 19 . . . , and that the quantities and condition of each article are as recorded in the ledger on this date."

(d) *Surplus equipment*.—Any articles found surplus at stocktaking will, in all circumstances, be brought on charge in the account. A list of such articles will be made and given a receipt voucher number to support their entry in the ledger.

(e) *Inspection of certificates by competent medical authority.*—After each stocktaking, the officer in charge will forward to the competent medical authority for his inspection and information a certificate of stocktaking (Form 33) recording, in the appropriate columns, all Class "A" stores as found on check and as recorded in the ledger; also duplicate "fair wear and tear" certificates (*see* para. 376) and duplicate certificates showing the expenditure of dangerous drugs since the preceding stocktaking. If the competent medical authority is satisfied that the certificates are in order, he will endorse and return the Form 33 and the duplicate copies to the officer in charge, to support the account.

390. Boards of Survey.—1. *Authority.*—Survey Boards on medical and dental equipment will be assembled on the authority of the competent medical authority of a command.

2. *Composition.*—The board will be composed of officers of the medical branch and will consist of a president and, if available, two members. The president should be an officer not below the rank of squadron leader and one member a quartermaster when practicable. When dental equipment is being conditioned, a dental officer should be detailed as one of the members.

3. *Procedure.*—(a) The articles to be surveyed will be detailed on Form 681, compiled in duplicate, and both copies signed in the appropriate space by the officer in whose charge the equipment is held.

(b) Both copies of Form 681 will be completed in accordance with the instructions on the form and forwarded to the competent medical authority, who, if he concurs, will sign in the space provided to authorize the convening of the board.

(c) The board will show the articles surveyed under the appropriate headings on the form.

(d) On completion of the survey, both copies of Form 681 will be forwarded for approval and signature to the competent medical authority.

4. *Disposal of unserviceable equipment.*—(a) If the competent medical authority is satisfied that the articles are no longer of use for their purpose, he will issue instructions for reduction to produce. Care will be taken to save all materials of value such as metal parts of X-ray tubes, platinum, silver, etc.

(b) The produce will be brought to account by conversion voucher (Form 21) prepared from the proceedings of the board of survey, and will be disposed of under the instructions of the air or other officer commanding.

(c) Articles recommended to be destroyed will not be written off charge until authority has been obtained from the competent medical authority (*see* clause 3 (d)), and until destruction has been carried out in the presence of an officer, who will sign the necessary certificate of destruction on both the Forms 681. One Form 681 will then be sent to the competent medical authority for retention and the other kept to support the medical account.

391. Identification of Gas Cylinders.—To facilitate the identification of gas cylinders used for medical purposes distinctive markings, as shown in the following colour scheme, have been drawn up in conformity with the standards laid down by the Home Office. The name or chemical symbol of the gas is stencilled or painted on the shoulder of the cylinder:—

Gas.		Ground Colour of cylinder.	Colour of bands.
Name.	Symbol.		
Carbon dioxide (for inhalation).	CO ₂	Green with black bottom.	—
Carbon dioxide (for snow-making).	CO ₂	Green	—
Ethylene ..	C ₂ H ₄	Mauve	Red.
Nitrous oxide ..	N ₂ O	Black	—
Oxygen	O	Black	White.
Oxygen (92%) and C.O. ₂ (8%) mixture.	O and CO ₂	Black	Green with white neck.

392. Supply of Spectacles.—1. *Instructions.*—Instructions governing the supply of spectacles for distance and close work and change of lenses are contained in K.R. & A.C.I., para. 1665A.

2. *Ophthalmic examination.*—An airman for whom it is proposed to provide glasses will, if possible, be examined by a R.A.F. ophthalmic specialist, otherwise he will be sent to the nearest Service ophthalmic centre.

3. *Demands and disposal of prescription forms.*—A demand will be forwarded to the Air Ministry on Form 1209 accompanied by two copies of the prescription on Form 1768 (Army Form I. 1240). A third copy of the prescription will be placed in the airmen's medical history envelope and given the appropriate enclosure number.

4. *Lens limits.*—Spectacles will normally be provided only within the following lens limits:—

(a) No simple spherical lens will be supplied of less strength than 0.50 dioptré, nor of a greater strength than 10.00 dioptrés.

(b) No simple cylindrical lens will be supplied of a less strength than 0.50 dioptre, nor of a greater strength than 6.00 dioptries.

(c) No sphero-cylindrical lens will be supplied having before or after transposition :—

(i) either of its component parts less than 0.50 dioptre ;

(ii) a combined strength greater than 12.00 dioptries ; or

(iii) a cylindrical strength greater than 6.00 dioptries.

(d) Lenses of strengths outside the limits indicated above will, however, be supplied at the public expense to airmen engaged in more or less continuous close work, or work entailing eye strain. These exceptional issues will be supported by remarks showing the nature of the work.

(e) No lens with intervals of less than a quarter of a dioptre will be supplied in any circumstances.

5. *General considerations.*—The following general considerations should be kept in mind when ordering spectacles :—

(a) Though many airmen have become so accustomed to the use of spectacles in civil life, especially when engaged in clerical work, that they may be at a serious disadvantage without them, yet there are many who have never worn spectacles, although they have a definite error of refraction, and they will not wear them unless they find obvious benefit from their use. This is especially so in wet weather, when the difficulty in keeping glasses clean makes many airmen prefer to do without them.

(b) As a matter of experience it is found that airmen in the following classes do not as a rule require spectacles, and that supply is not justified :—

(i) Myopia of 1D and under.

(ii) Hypermetropia of 2D and under, below the age of 30 years.

(iii) A slight degree of astigmatism, in spite of occasional headaches.

(iv) One amblyopic eye and the other with normal vision.

6. *Replacement of broken spectacles.*—When replacement of broken spectacles is required, Form 1230 will be prepared and forwarded to the competent medical authority. After approval has been obtained, application will be made through the competent medical authority to the Air Ministry on Form 1209 accompanied by the broken spectacles and a copy of Form 1230.

7. *Spectacles on repayment.*—(a) If an airman requires spectacles on repayment in accordance with the conditions laid down in K.R. & A.C.I., para. 1665A, clause 3, and is

willing to pay for them, both copies of the prescription form will be marked in red ink "Subject to payment by the airman concerned." Recovery will be made from the airman's pay by the unit accountant officer on Form 664B or 1230, whichever is more suitable to the particular case.

(b) The copy of the prescription which is enclosed with the spectacles will be signed by the airman and returned by the medical officer direct to the Optical Appliances Depot without delay.

8. For regulations regarding the wearing of spectacles with Anti-Gas Respirators by Officers, *see* A.M.O. A.52/37.

393. Special Goggle Lenses for Pilots.—1. *Procedure for ophthalmic examination.*—When a medical officer considers that a pilot (officer or airman), air gunner, air observer or W/T operator engaged on flying duties, suffering from defective vision, requires correcting lenses in his goggles, he will forward a recommendation to that effect through the C.O. of the unit to the competent medical authority, who, in the case of personnel serving at home, will cause the officer or airman to be examined at the Central Medical Establishment, and abroad will take such action as he considers advisable.

2. *Supply.*—These lenses are not a medical supply but are obtained through the unit Equipment officer (*see* K.R. & A.C.I., para. 2571).

394. Supply of Artificial Limbs, Eyes, Surgical Appliances and Boots.—1. *Method of demanding.*—(a) When a first supply of an artificial limb, eye, surgical appliance or boot is required for the use of an officer or airman, a demand on Form 1209 will be forwarded to the Air Ministry, through the usual channels (for surgical boots and special boots *see* K.R. & A.C.I., paras. 1661 and 2539 respectively). The demand for an artificial limb or eye will not be forwarded before the stump of the limb or the eye socket is in a fit state for the necessary fitting to take place.

(b) The name, initials and rank of an officer, and the name, initials, rank and official number of an airman will be stated in the remarks column, and if the supply of an appliance is a first issue, the fact will be stated, otherwise the date of the last issue will be recorded. A statement as to whether or not the disease or injury necessitating the supply was attributable to conditions of service will also be entered.

(c) When surgical appliances are required for the use of officers of the Royal Navy or Army holding temporary commissions in the Royal Air Force in respect of service injuries received prior to joining the R.A.F., full particulars of the injury, date, etc., will be given.

(d) Replacements will be demanded in the same manner so long as the officer or airman continues to serve in the Royal Air Force.

(e) When a limb has been delivered, the dates of all visits to the limb-fitting centre will be notified to the Air Ministry.

2. *Local purchase abroad.*—In commands abroad, local purchase of surgical appliances may be made if the appliances can be obtained at a reasonable cost and are not available from store. The same rules will apply to such surgical appliances as are allowed for issue to airmen's families (see K.R. & A.C.I., para. 1664).

3. *Liability of individual.*—The wearer of a surgical appliance will be liable for the cost of replacement where carelessness is proved to be the cause of damage. A truss should last at least six months when the wearer is engaged in manual labour, and in other cases longer. If replacement of a truss is required within six months, or of any other appliance before the expiration of a reasonable period, the medical officer will state on the demand the special reasons which make the replacement necessary. (See paras. 259 and 270 with regard to recording, issue and accounting procedure respectively, also K.R. & A.C.I., paras. 1659 to 1667.)

395. Radiant Heat Cradles.—1. Radiant heat cradles will be constructed by the Works services. Authority for construction will be obtained from the competent medical authority and passed to the local works officer with a request that the work be undertaken in accordance with A.P. 855, para. 243.

2. The cradle will be vouched to the sick quarters or medical unit on Form 600 in triplicate, and will be shown in the medical equipment account as a complete item.

3. Repairs and replacements will be made by direct arrangement with the works officer.

SECTION II.—FIRST-AID EQUIPMENT

400. First-aid Outfits for Aircraft.—1. *Scale.*—First-aid outfits for aircraft will be supplied to all aircraft to the following scale :—

(a) Aircraft with accommodation for a crew up to 3 members—one outfit.

(b) Aircraft with accommodation for a crew of from 4 to 6 members—two outfits.

(c) Aircraft with accommodation for a crew of over 6 members—three outfits.

2. *Accounting.*—They will be held on charge in the medical equipment ledger of the R.A.F. unit by the unit medical officer.

3. *Checking*.—In order to check unauthorized opening, all outfits, when completed in accordance with the authorized scale, will be bound with a strip of tape passed through the buckle, and the ends of the tape secured by a seal stamped with a distinctive impression such as that of the 1 drachm weight from the dispensing scales. The medical officer will inspect them periodically to see that they are maintained in proper condition, and if the seal of any outfit is found to be broken or to bear a different impression from the original one, the outfit will be opened and the contents checked.

4. *Demands by units*.—Outfits will be demanded by flight commanders from the unit medical officer, who will obtain a temporary receipt on Form 600 ; they will not be struck off charge in the medical equipment ledger.

5. *Responsibility of flight commander*.—Flight commanders will be responsible for the presence of outfits in aircraft entitled to carry them, and for loss or damage to such outfits or their contents.

6. *Replacement*.—Details of expenditure requiring replacement, or loss or damage, will be notified by the flight commander to the unit medical officer.

7. *Loss or damage*.—In the event of loss or damage to outfits or their contents, the procedure laid down in K.R. & A.C.I., paras. 1644 to 1647, will be followed.

8. *Procedure on "strike-off"*.—If an outfit, with contents complete, is wholly or partially destroyed in an accident to a service aircraft, Forms 1230 will be prepared in triplicate and passed to the C.O. of the unit to be certified in accordance with A.P. 830, Vol. I, Chapter 22, para. 2, clause (iii). The forms will then be passed by the command equipment officer to the competent medical authority of the command concerned who will ensure that the necessary "strike off" or "write off" authority is recorded on them. After this action will be taken in accordance with K.R. & A.C.I., para. 1646.

9. *Replacement*.—Replacements for an outfit or its contents will be demanded by the medical officer in accordance with para. 368.

10. The contents are detailed in A.P. 132, Scale C.1.

401. First-aid Outfits for Aircraft and Armoured Cars in the Tropics and Sub-tropics.—1. *Scale*.—These outfits will be supplied to the following scale :—

(a) For each flight of three aircraft undertaking long distance flights abroad—one outfit.

(b) For each armoured car abroad—one outfit.

(N.B. Outfits for armoured cars have different containers from those for aircraft.)

(c) For each flight of five aircraft undertaking long distance flights abroad—two outfits.

(d) A reserve of one outfit for every six held, with a minimum of one for each unit.

2. *Storage*.—When not required for immediate use they will be kept in the unit sick quarters, otherwise the custody and maintenance will be as detailed in para. 400, clauses 2 to 9, with the exception of the seal procedure.

3. The contents are detailed in A.P. 132, Scale C.2.

402. First-aid Outfits for Aircraft when Troop-carrying.—

1. *Scale*.—These outfits will be supplied to the scale of one for each aircraft troop-carrying, with a reserve of one for each squadron.

2. Custody and maintenance will be as detailed in para. 400, clauses 2 to 9, with the exception of the seal procedure.

3. The contents are detailed in A.P. 132, Scale C.3.

403. Labels for Use with Tubunic Ampoules.—1. Whenever morphia is given to a patient by means of a tubunic ampoule, a label stating the fact will be attached to the patient's clothing.

2. *Scale*.—These labels will be demanded from the R.A.F. Medical Stores Depot, Hartlebury, on a basis of—

(a) Two for each first-aid outfit for aircraft.

(b) Six for each first-aid outfit for aircraft and armoured cars in the tropics and sub-tropics.

(c) Eight for each first-aid outfit for aircraft when troop-carrying.

(d) Six for each motor ambulance or ambulance motor boat medical equipment.

(e) A reserve of twelve in each sick quarters.

These labels will not be taken on ledger charge.

404. First-aid Outfits for Workshops.—In the United Kingdom adequate first-aid equipment will be maintained in all workshops in order to comply with the Factory and Workshops Acts. Abroad the equipment will be as authorised by the competent medical authority. The contents of the authorised equipment are detailed in A.P. 132, Scale C.4.

407. The First Field Dressing.—1. *General*.—A field dressing forms a part of the kit of every member of the Royal Air Force on active service and is therefore available at all times and in all places as a first dressing for wounds. This item is an equipment supply (Ref. No. 22B/19). When personnel proceed on active service, the first field dressing will be carried in the inside pocket of the skirt of the tunic on the right side. It is an equipment, and not a medical, supply.

2. *Description*.—It consists of an outer covering of khaki cotton cloth containing two dressings each complete in itself. Each dressing consists of :—

(a) A loose-woven khaki bandage $2\frac{1}{2}$ yards long by $2\frac{1}{2}$ inches wide.

(b) A piece of bleached cotton gauze 36 inches by 23 inches which has been impregnated with acriflavine to the extent of 0.1 per cent. This is folded into a pad 4 inches by $3\frac{1}{2}$ inches and stitched to the bandage 18 inches from one end.

(c) One safety-pin wrapped in wax paper and loosely stitched to the inner cover.

The long end of the bandage is loosely rolled on itself up to a point 18 inches from the pad and secured by a tight stitch to prevent unrolling. The stitch is easily broken without tearing the bandage. The remaining 18 inches of bandage between the roll and gauze pad is folded into pleats. The gauze pad and bandage are enclosed in a parchment paper, sterilized, and enclosed in an inner waterproof cover. This inner cover, which is of jaconet, is efficiently sealed so as to render the package air-tight. At one corner, indicated by an arrow, the fabric is turned inwards to facilitate opening.

408. Shell Dressing.—This is a large form of first field dressing for extensive wounds, issued by the medical branch. It is not carried by the individual, but haversacks are supplied each containing 12 shell dressings.

Each packet measures 6 inches by 4 inches and contains a pad consisting of three layers, namely, unbleached wool, absorbent wool and gauze.

A bandage 3 yards long and 4 inches wide is stitched to the unbleached side of the pad 24 inches from one end. A safety-pin is enclosed in waxed paper.

The pad is folded once on itself so that the bandage lies outside and is enclosed in three layers, in a similar way to the first field dressing, by parchment paper, a jaconet covering, and an outer cover of khaki cotton cloth.

The shell dressing is treated in the same way as the first field dressing by being impregnated with neutral acriflavine and then enclosed in the parchment paper. The dressing is sterilized, the paper closed aseptically, and the waterproof covering of jaconet applied and sealed.

Directions for its use, which are on similar lines to those for the first field dressing, are printed on the outer khaki cotton cloth.

SECTION III.—MEDICAL MOBILIZATION EQUIPMENT, SCALE, STORAGE, ACCOUNTING AND INSPECTION IN PEACE TIME

410. Scales.—The scales of medical mobilization equipment are detailed in A.P. 132.

411. General Instructions.—1. Certain mobilization equipment (*e.g.* gas treatment panniers) is held at stations and will always be regarded as part of the medical equipment for units operating from those stations.

2. *In the United Kingdom.*—Equipment for units liable to be sent overseas is held at the Medical Stores Depot, Hartlebury, and will be despatched as part of the unit mobilization equipment to the station or port of embarkation where it is required.

3. *Abroad.*—It will be held at the medical stores depot or R.A.F. hospital, or where no medical stores depot or R.A.F. hospital exists, at the station concerned.

4. *General.*—Medical mobilization equipment will be kept at all times ready for immediate issue and will be reserved exclusively for the station or unit to which it is allotted. No portion of this equipment (except as allowed by para. 414) will be taken into use in peace time without prior sanction from the Air Ministry.

5. Articles will not be removed from medical mobilization equipment until a new supply has been obtained to replace them.

6. Emergency reserve medical equipment held by units and at stations in the United Kingdom will be checked periodically, and any necessary turn-over made from local stocks.

412. Accounting.—Accounting will be as for other medical equipment. The hypodermic and ophthalmic tablets contained in the composite articles will not be taken on charge in the body of the account. A list showing the quantities of such tablets will be attached to the list of contents inside each composite article.

413. Annual Inspection of Mobilization Equipment.—Competent medical authorities will arrange for the assembly of a board of medical officers or, in the case of a unit where there is no serving medical officer, a medical officer from the Headquarters Staff, to examine thoroughly all mobilization equipment held on charge in their commands. A report will be made on Form 681 showing the individual articles of medical equipment examined, their condition, and the steps recommended to be taken for the replacement or exchange of any item. A statement will be included noting which items should be utilized with a view to facilitating an adequate turnover. A general statement on the condition of the equipment in the

Command will be forwarded by the competent medical authority to reach Air Ministry in October of each year

414. Turnover.—All articles of mobilization equipment liable to deterioration will be turned over, as far as is practicable, every year. At medical stores depots the turnover will be effected by issue to hospitals or sick quarters for use in the current quarter.

SECTION IV.—DAMAGE, LOSS AND DEFICIENCIES

420. General Instructions.—1. These will be dealt with in accordance with the procedure laid down in para. 376 and K.R. & A.C.I., paras. 1644 to 1647. The authority (*e.g.* Fair Wear and Tear Certificate, Form 1230, etc.), for writing any article off charge will be quoted in, and will accompany, the ledgers.

1A. A competent medical authority may authorise the write-down or strike-off and disposal of medical or dental stores which have deteriorated through age or climatic conditions, provided that the deterioration is clearly shown not to have arisen from causes within the control of any person responsible for the items and the amount of the deterioration does not exceed £1 in value. When the amount of deterioration exceeds £1 in value, the approval of the Air Ministry for the write-down or strike-off will be sought, accompanied by a report showing :—

- (a) When and whence the article was received.
- (b) Condition of the article.
- (c) Nature and known or suspected causes of deterioration.
- (d) Recommendation as to how the article should be disposed of.

2. When Forms 1230 are rendered for the strike-off of Class "A" equipment, which has deteriorated under normal conditions, or has been worn out by fair wear and tear in use, care will be taken to make this fact clear to the competent medical authority, as such a strike-off does not constitute a formal loss.

421. Assessment of Charges.—1. When charges are made for articles so damaged as to render them unfit for further use, every reasonable and just allowance for fair wear and tear will be made to the same degree as for other R.A.F. equipment (*see* clause 3 (b) A.P. 830, Vol. I, Chapter 23).

2. The charges to be made will be taken from the current Priced List of Medical Equipment for the Army, a copy of which is held by the competent medical authority of each command. If the article is not quoted therein, the charge will be ascertained from the Air Ministry.

3. Charges for articles lost or damaged (culpably or through contributory neglect) will be assessed as follows :—

(a) *Repairable damage*.—The actual cost of repair, obtained when necessary from the Air Ministry, will be charged.

(b) *Loss or damage beyond repair*.—The full value of the article when new (including departmental expenses) will be charged unless it is established by evidence that at the time of loss or damage the actual value was less. In this case a depreciated rate of not less than three-fifths (one quarter in the case of textile articles) will be charged.

422. Individual Responsibility for Equipment on Charge.—(See K.R. & A.C.I., para. 85.)

SECTION V.—MEDICAL AND DENTAL EQUIPMENT.—PROCEDURE FOR ACCOUNTING AND DEMANDING IN TIME OF WAR.

427. Units on Active Service Overseas.—1. No accounting action for equipment will be taken by units in the field beyond the base area ; but, for the purpose of provisioning, a record of receipts and issues is to be maintained. Any surplus, repairable or unserviceable Class “A” equipment is to be returned to the nearest advanced or base depot medical stores, whether Army or R.A.F.

2. Demands are to be submitted on Form 1209, in triplicate, direct to the nearest advanced or base depot medical stores, either Army or R.A.F. The Form 1209 will be used as a demand and also an issue and receipt voucher.

3. A R.A.F. advanced or base depot medical store is to maintain a ledger account and tally cards. Demands on the R.A.F. Medical Store Depot at home are to be submitted on Form 1209 in quadruplicate.

4. Periodical stocktakings may be dispensed with at a R.A.F. advanced or base depot medical store on the authority of the competent medical authority, but frequent checks are to be made of items of stock, selected according to their importance. These checks are to be designed so as to ensure :—

(a) That important repairable items are not held without repair action ;

(b) that all equipment is on charge ;

(c) that tally card balances are correct.

5. The competent medical authority is authorised to write off lost or damaged equipment up to the value of ten pounds in any one case, provided that the damage is not due to theft,

fraud, arson or gross carelessness. All such losses are to be recorded in a losses book held by the competent medical authority. Write-offs exceeding this limit and losses by deterioration exceeding £1 in value are to be referred to the air or other officer commanding for approval.

428. Units serving at peace-time stations overseas.—On receipt of Air Ministry authority, the procedure detailed in para. 429, modified to meet local procedure, may be adopted.

429. Units serving at home stations.—1. The extent to which the peace-time system of accounting is to be modified at home stations will depend on the theatre of war and the scope of operations. No alteration is to be made in the peace-time system except under Air Ministry authority.

2. On receipt of Air Ministry instructions, the following system is to be adopted :—

(a) Units are to forward demands on Form 1209, in quadruplicate, for all stores, excluding Calf Lymph, Vaccines and Sera, and special surgical appliances, direct to the Medical Store Depot. Demands for Calf Lymph are to be prepared and despatched in accordance with the instructions in para. 369, 1 (a); those for all Vaccines and Sera are to be forwarded in quadruplicate to the Officer Commanding, R.A.F. Institute of Pathology and Tropical Medicine, Halton. Demands for special surgical appliances (surgical boots, artificial eyes, belts, artificial limbs, etc.) are to be sent to the competent medical authority for onward transmission to the Air Ministry (M.A.3).

(b) The Forms 1209 sent to the Medical Store Depot will be disposed of as follows :—

(i) *First copy* is to be used at the Medical Store Depot as an issue voucher.

(ii) *Second and third copies* are to be forwarded to the unit at the same time as the stores. The second copy, duly receipted, is to be sent to the competent medical authority for notation of Class "A" equipment and for transmission to the Medical Store Depot, where it is to be filed with the first copy. The third copy is to be retained as the unit's receipt voucher.

(iii) *Fourth copy* is to be forwarded to the Air Ministry (M.A.3) from the Medical Store Depot after annotation of the action taken on the demand. Care must be taken to ensure that all copies are legible.

(c) The following points are to be noted in making out demands :—

(i) Dangerous drugs are to be demanded on a separate sheet.

(ii) Demands from station sick quarters and small units for medical equipment not authorised by A.P. 132 or already sanctioned by the Air Ministry are to be forwarded to the competent medical authority for approval and for transmission by him to the Medical Store Depot.

(iii) The column on Form 1209 "No. or quantity issued" is always to be left blank when the demand is transmitted.

(d) Articles sent direct to units by contractors will be vouched on Forms 712 and 712a. The Form 712 is to be retained as a receipt voucher and the Form 712a, after being receipted, is to be sent to the competent medical authority for notation of Class "A" equipment, and for transmission to the Air Ministry (M.A.3).

(e) An account of receipts and issues is to be maintained by units on Forms 823. The Forms 823 in use prior to the emergency period are to be continued.

(f) Dangerous drugs and poisons are to be accounted for in accordance with the instructions in para. 378.

(g) Supplies of proprietary medicines will be difficult to obtain. Such items are to be demanded only when absolutely necessary.

3. Surplus, repairable or unserviceable Class "A" equipment is to be returned direct to the Medical Store Depot and vouched on Form 600. The blue copy of the voucher is to be forwarded direct to the Medical Store Depot; the red copy is to be forwarded to the competent medical authority for notation of any returned Class "A" equipment and transmission of the voucher to the Medical Store Depot. On receipt of the red copy the Medical Store Depot is to return the blue copy, duly receipted, to the unit returning the equipment. Any replacements required are to be demanded on Form 1209.

4. The normal annual stocktaking may be dispensed with by the competent medical authority, but frequent checks are to be so arranged that, over a period of twelve months, all stores held are covered. These checks are to be so designed as to ensure economy and control over the equipment; whenever stocks are thus checked the relevant accounts are also to be adjusted.

5. The unit medical or dental officer is authorised to strike off equipment which has become unserviceable in use in accordance with the provisions of para. 376, clauses 2 and 3. The expenditure certificates are not to be sent to the competent medical authority except when Class "A" equipment is included.

6. The procedure for write-off as detailed in K.R. & A.C.I., paras. 1644, 1645, 1646 and 1647 is to be adhered to.

430. The Medical Store Depot.—1. The Medical Store Depot will place orders direct with the appropriate contractors for stocks of drugs, tablets, dressings, instruments, etc., the supply of which is governed by contracts or by contract arrangements covering supplies at a discount off catalogue prices. Copies of all such orders are to be sent to the Air Ministry (M.A.3) with a statement showing the total cost of the order placed with each separate contractor. When the demand is placed, the contractor is to be instructed to forward Forms 712 and 712a to the Medical Store Depot for certification, and to render Form 666 or his ordinary bill form to the Air Ministry (M.A.3) for payment.

2. Demands for non-contract items are to be forwarded to the Air Ministry (M.A.3).

3. The Medical Store Depot will arrange direct with contractors for the repair and overhaul of instruments and appliances. Issues to the contractor are to be made on Form 603. On return of the equipment a receipted copy of Form 712a is to be prepared and sent to the Air Ministry (M.A.3) for payment action.

4. All other accounting procedure is to be maintained as far as is compatible with the speedy issue of stores.

431. Reversion to peace-time procedure.—As soon as possible after the termination of hostilities, or on instructions from the Air Ministry (M.A.3) to revert to peace-time accounting, a complete stocktaking of all equipment in possession of units, including the Medical Store Depot, is to be carried out, and all necessary adjustments effected.

SECTION VI.—PRECAUTIONS TO BE OBSERVED IN CONNECTION WITH X-RAY AND RADIUM INSTALLATIONS

440. General.—The following recommendations regarding protective measures to be taken in connection with X-ray and radium installations are based on those contained in the fourth report of the British X-ray and Radium Committee

dated June, 1934. Effect will be given to these recommendations in new X-ray installations and in existing installations as far as it is possible to do so without marked material structural alterations.

441. Recommendations regarding X-Ray Departments.—

1. *Position of rooms.*—X-ray departments should not be situated below the ground floor level.

2. *Windows.*—All rooms, including photographic dark rooms, should be provided with windows affording good natural lighting and ready facilities for admitting sunshine and fresh air whenever possible.

3. *Ventilation.*—All rooms, including photographic dark rooms, should be provided with adequate exhaust ventilation capable of renewing the air of the room not less than ten times an hour. Low-level air inlets and high-level outlets should be arranged to afford crosswise ventilation of the room.

4. *Decoration.*—All rooms should preferably be decorated in light colours.

5. *Dimensions.*—X-ray rooms should be large enough to permit a convenient lay-out of the equipment. A minimum floor area of 250 square feet (25 square metres) is recommended for X-ray rooms and 100 square feet (10 square metres) for dark rooms. Ceilings should not be less than 11 feet (3.5 metres) high.

6. *Working temperature.*—A working temperature of about 65° F. (18° C.) is desirable in X-ray rooms.

7. *Position of apparatus.*—Whenever practicable, the X-ray generating apparatus should be placed in a separate room from the X-ray tube.

8. *Protection of Walls for X-ray treatment.*—In the case of X-ray treatment, a protective wall, the lead equivalent of which will depend on the circumstances, will be available outside which the operator can stand. In the case of a single X-ray tube excited by voltages up to about 200 K.V., the protective wall should have a lead equivalent of not less than 4 mm. For higher exciting voltages or more than one X-ray tube, or for heavy tube-currents, the wall protection should be proportionately increased. The wall protection should also be increased if the protective value of the X-ray tube enclosure falls short of the values given in para. 442, clause 3. In such event the remaining walls, floor and ceiling may also be required to provide supplementary protection for adjacent occupants to an extent depending on the circumstances.

442. X-Ray Protection.—1. It should not be possible for a well-rested eye of normal acuity to detect in the dark appreciable fluorescence of a screen placed in the permanent position of the operator.

2. *Protection of the tube.*—The X-ray tube should be self-protected, or otherwise surrounded as completely as possible with protective material of adequate lead equivalent.

3. *Lead equivalents.*—The following lead equivalents are recommended under average conditions:—

X-rays generated by peak voltages not exceeding.	Minimum equivalent thickness of lead.
75 K.V.	1.0 mm.
100 "	1.5 "
125 "	2.0 "
150 "	2.5 "
175 "	3.0 "
200 "	4.0 "
250 "	6.0 "
300 "	9.0 "
350 "	12.0 "
400 "	15.0 "

4. *The operator.*—In the case of diagnostic work with other than completely protected tubes, the operator should be afforded protection from stray radiation by a screen of a minimum lead equivalent of 1 mm. Screening examinations should be conducted as rapidly as possible with minimum intensities and apertures. Palpation with the hand should be reduced to a minimum.

5. *The diaphragm.*—The material of the diaphragm should be equivalent to not less than 2 mm. of lead. The diaphragm should be of the rectangular type, and the design should be such as to permit it to be completely closed. To prevent the lateral escape of direct radiation, the diaphragm should be fitted within a protective enclosure.

6. *The fluorescent screen.*—The lead glass of fluorescent screens should have the protective values recommended in clause 3. In the case of screening stands, the fluorescent screen should, of necessity, on account of its small size, be provided with a protective "surround" so that adequate protection against direct radiation is afforded for all positions of the screen and diaphragm. An "apron" of protective material not less than 2 ft. wide and of not less than $\frac{1}{2}$ mm. lead equivalent should be attached to the lower edge of the screen.

7. *Screening couches.*—These should provide adequate arrangements for protecting the operator against scattered radiation from the patient. In the case of a couch, this can take the form of a protective screen, mounted on the carriage and of material equivalent to not less than 1 mm. of lead. The screen should have a width of not less than 2 ft., and should project 9 or 10 in. above the couch.

8. *Protective gloves.*—Gloves suitably lined with fabric or other material, should have a protective value not less than $\frac{1}{2}$ mm. of lead throughout both back and front, including fingers and wrist.

9. *Protective aprons* should have a minimum lead value of $\frac{1}{2}$ mm.

443. General Precautions.—1. The dangers of over-exposure to X-rays can be avoided by the provision of adequate protection and suitable working conditions. It is the duty of those in charge of X-ray departments to ensure such conditions for their personnel. The known effects to be guarded against are :—

(a) Injuries to the superficial tissues.

(b) Derangements of internal organs and changes in the blood.

2. An X-ray operator will on no account expose himself unnecessarily to a direct beam of X-rays, but will place himself as remote as practicable from the X-ray tube.

444. Working Hours.—The following hours which are recommended for whole-time X-ray workers in civilian institutes are added for guidance only, as it is realised that the exigencies of the service do not permit of their complete adoption in service medical establishments.

1. Not more than seven working hours a day.

2. Not more than five working days a week. The off-days to be spent out of doors as much as possible.

3. Not less than one month's holiday a year.

4. Whole-time workers in hospital X-ray departments should not be called upon for other duty.

445. Medical Supervision of Radiographers.—1. No person will be employed as a radiographer whose blood (as tested by a complete investigation of the blood) or general health is unsatisfactory.

2. *Examination before selection for training.*—Before beginning training, the normal leucocyte level will be found by making three total and differential blood counts in the afternoon. The counts may be made on different afternoons, or on the same afternoon at half-hourly intervals. If none of the total counts reach 6,000 per c.mm. and none of the lymphocyte counts reach 1,200 per c.mm., the applicant will not be accepted for training. Records of these counts will be made on Form 39 (card and flimsy) and headed "Examination of blood—for training as radiographer." The Form 39 will be disposed of through the competent medical authority.

3. *Periodic examinations.*—Trained radiographers will be submitted at least twice a year to a thorough medical examination and total and differential blood counts will be carried out at the same time, records being preserved in the unit. If at any time there is found to be a decided and sustained drop in either the total leucocyte or the total lymphocyte count the worker will be withdrawn from X-ray work, and placed under treatment for an adequate period. In these circumstances the records of the counts will be embodied on a Form 39 which will be disposed of as in clause 2 above.

446. Electrical Precautions in X-ray Departments.—1. The floor-covering of the X-ray room should be of insulating material such as wood, rubber or linoleum.

2. Overhead conductors should be not less than 9 ft. from the floor. They should consist of stout metal tubing or other coronaless type of conductor. The associated connecting leads should be of coronaless wire kept taut by suitable rheophores.

3. Wherever possible, earthed guards or earthed sheaths should be provided to shield the more adjacent parts of the high-tension system. Unshielded leads to the X-ray tube should be in positions as remote as possible from the operator and the patient, and indiscriminate handling of X-ray tubes during operation should be forbidden.

4. Unless there are reasons to the contrary, metal parts of the apparatus and room should be efficiently earthed.

5. Main and supply switches should be very accessible and distinctly indicated. They should not be in the proximity of the high-tension system, nor should it be possible for them to close accidentally.

6. The use of quick acting double-pole circuit breakers is recommended. Over-powered fuses should not be used. If more than one apparatus is operated from a common generator, suitable high-tension multi-way switches should be provided.

9. Some suitable form of kilo-voltmeter should be provided to afford a measure of the voltage operating the X-ray tube.

10. Whenever possible a safety spark-gap should be provided.

11. Suitably illuminated warning devices which operate when the equipment is "alive" are found to serve a very useful purpose.

12. Mobile units in particular should be carefully examined on each occasion before use.

13. Every step possible should be taken to prevent accidental contact with any part of the high-tension system, including the tube, the leads and the associated measuring instruments.

14. Low flash-point anaesthetics should never be used during X-ray examinations (*see* Section VIII of this Chapter).

15. First-aid instructions dealing with cases suffering from the effects of electric shock will be hung in each X-ray department, and the staff trained in their use.

447. Storage Precautions for Inflammable X-Ray Films.—

1. *General.*—Inflammable X-ray films are composed of cellulose nitrate which, when ignited, burns with extreme rapidity and violence. The burning of cellulose nitrate in bulk is well-nigh explosive in character. In addition, large quantities of carbon monoxide and brown fumes of oxide of nitrogen may be generated, both of which are highly toxic. The following precautions, therefore, should be taken as regards the use and storage of inflammable X-ray films to prevent fire :—

2. *X-ray rooms.*—(a) In all rooms where X-ray films are handled and stored, naked lights and open fires will be prohibited. Smoking will be prohibited in or near film cabinets or film stores. Films will not be placed near steam pipes or radiators. A ready supply of fire extinguishers, buckets of water and sand will be available. The best means of extinguishing burning celluloid is by the application of water.

(b) Electric light installations should be of a permanent character. Electric light bulbs in or near film stores or cabinets should be enclosed in strong glass globes.

(c) Generous ventilation should be provided in X-ray rooms. As recommended in para. 441, the plan of an independent exhaust fan in each room is to be preferred to a duct system common to a number of rooms. Doors should be arranged to open outwards, particularly from film-drying and photographic dark-rooms.

(d) Stocks of unexposed films for immediate use and current files of developed films, retained in X-ray rooms, will be kept down to a minimum, and should not exceed at any time a total of about 50 lb. (*i.e.* about 1,000 12 in. by 10 in. films) distributed among several cabinets. These films should be stored in cool and dry, lock-up, thermally-insulated metal or hardwood cabinets. Cabinets for unexposed films should be lead-lined.

(e) Developed films will be retained in X-ray rooms only as long as they are required for examination by the medical staff. Such films, taken temporarily into hospital wards or theatres for the convenience of the medical staff, will not be left lying about in table drawers or cupboards, but kept in suitable metal containers. They will be returned to the X-ray department and removed to the main film store for filing as soon as possible.

3. *Film stores.*—All X-ray films unexposed or developed and not required for current use, should be stored in a special dry, cool, well-ventilated store, isolated from other buildings if possible, and reserved exclusively for the purpose. The main requirements of such a store are as follows:—

(a) The situation of the film store should not be such as to endanger the means of escape from any part of a building. The store should not be in the proximity of a lift-shaft or staircase-well, or near an intake or outlet of a general duct-ventilating system. In no circumstances should the store communicate with a general duct-ventilating system. The store should preferably be an isolated single-storey building with independent access. Failing that, the store may be placed on the roof of a building or, if that is not feasible, in one of the higher storeys in as isolated a position as possible.

(b) The walls, floor and ceiling of the store room should be fire-proof and of robust construction. The door should be fire-proof and of a self-closing, closely-fitting type opening outwards. If the store room forms part of a main building, a useful further precaution is a fire-proof vestibule with a second fire-proof door.

(c) The store should be provided with a direct vent to the outer air, preferably on the side remote from the most adjacent building. Such a vent should not normally be less than a square foot in effective area, a figure which may require to be exceeded for large stores. The vent may be protected against weather, etc., by thin unwired glass or other equally frail device.

(d) The store may well be equipped with steel cabinets. If the store is designed to carry unusually large stocks of films (exceeding, say, 1 ton) it should be divided into completely isolated fire-proof compartments each with its own vent and fire-proof door.

(e) The temperature of the store should be maintained at a moderate figure. If the roof is exposed to the sun, suitable thermal lagging may be necessary in hot climates. It seems certain that good quality celluloid does not ignite spontaneously at any temperature attained under ordinary room conditions.

(f) If windows are provided in a film store, they are best situated in a north wall, though other considerations may be more important. Any windows immediately above the windows or vent of the store room should be provided with wired glass. (See also A.P. 957 and A.P. 830, Volume II, Leaflet G.10 as to fire precautions in the case of celluloid photographic and cinematographic films.)

448. Storage Period of Exposed X-Ray Films.—For record purposes exposed films will be retained for a minimum period of 5 years. Films exposed more than 5 years previously will be inspected once each year and those no longer required will be disposed of as follows :—

(a) *In the United Kingdom.*—By sale to contractors. Instructions will be issued by Air Ministry from time to time with regard to this.

(b) *Abroad.*—By destruction.

449. Radium Protective Recommendations.—(See the fourth report of the British X-ray and Radium Committee dated June, 1934.)

SECTION VII.—PRECAUTIONS AGAINST SHOCK FROM ELECTRO-MEDICAL APPARATUS OTHER THAN X-RAY INSTALLATIONS

455. 1. General.—In order that shock from electro-medical apparatus, other than X-ray installations, may be prevented, the following points should be carefully noted, and all necessary precautions taken.

(*Note.*—Industrial experience shows that, as regards the risk of serious shock, alternating currents are far more dangerous than direct currents.)

2. The electrical treatment of patients in bed.—It is essential an iron bedstead should by no possibility be in such a position as to act as a means of earthing the patient, that is, it should not be in contact with any earthed metal, e.g. heating or water pipes, radiators, or even an earthed

wireless receiver. The patients themselves should also be out of range of accidental contact with earthed metal. The increasing use of radiant heat baths, resuscitation cradles, thermal pads for eye and ear work, and similar appliances receiving current in direct connection with the main current supply, necessitates increased precaution lest the patient be accidentally earthed.

3. *Earthing*.—(a) Under conditions which probably obtain in many wards, it may well be that electrical safety is best secured by insulating electrical apparatus instead of adopting the alternative method of earthing it. Thus, in wards where the floor is of wood and there is little likelihood of contact with earthed metal, preference should be given to the use of reading lamps constructed of wood rather than of metal.

(b) In other situations, however, where there are conducting floors or earthed metal, the metal work of electrical apparatus should be earthed, and care taken to ensure the efficiency and maintenance of the earth connections.

(c) In bath-rooms or wash-rooms the use of any portable apparatus, or apparatus fixed within reach from the bath or basin, must be avoided.

4. *Electric pads*.—The source of supply for heat treatment by electro-thermal compresses should always be at low voltage. If direct current mains supply is used, a reduction in voltage may be effected by the provision of a motor generator, while, with alternating current, double-wound transformers, if necessary of a type tapped for regulation, should be interpolated between the source of supply and the patient.

5. *Radio headphones*.—Patients will not wear headphones while undergoing electrical treatment.

6. *Radiant heat baths*.—(a) These should be constructed as follows :—

(i) An internal mesh screen should be fitted to cover and protect the lamps and holders.

(ii) The lampholders should be of insulating material, of heat-resisting character.

(iii) Metal work should be earthed.

(b) Special attention should be paid to ensure that the fittings do not become loose.

7. *Projectors for light treatment*.—These possess the common feature of exposure of live conductors within the reflectors, and there is similar exposure with the use of arc lamps.

Although it is unlikely that live parts would be touched while such apparatus is in use, there is some risk, which could be minimised by the provision of mesh guards, to the operator.

Earthing of the metal work of projectors is desirable.

8. *Sets for generating electricity* (i.e. *Galvanic, Faradic and Sinusoidal currents*).—No apparatus will be worked from a service main which is not earth-free. Non-earth-free apparatus comprises galvanic and faradic tables, galvanic and faradic switchboards and Bristow coils, cautery burners and cavity lamps connected to sources of mains supply through resistance windings.

9. *Apparatus for diathermy treatment*.—Only apparatus will be used in which :—

(a) The patients' circuit is electrically isolated from the intermediate (or spark gap) circuit ;

(b) The spark gap is mounted inside the cabinet or enclosure containing the apparatus ;

(c) The door of the cabinet or enclosure is so interlocked with the source of main supply as to ensure that the latter is disconnected when the door is opened.

10. *Systematic inspection*.—In hospitals in the United Kingdom, inspection of apparatus is carried out twice yearly by a firm of manufacturers as arranged by the Air Ministry (M.A.3). In addition, medical establishments at home and abroad will arrange for the earth connections of apparatus to be inspected at frequent intervals and tested by the Works electrical staff once a year.

Note.—The above recommendations are based on Ministry of Health Memorandum 161 Med. dated 25th May, 1932.

SECTION VIII.—PRECAUTIONS AGAINST ANÆSTHETIC EXPLOSIONS

460. *General Considerations*.—Two main factors are liable to increase the risk of accidents due to explosions when anæsthetics are being used.

(a) The administration of ether and oxygen mixtures.

(b) The use of electrical apparatus close to the patient during anæsthesia (see Sections V and VII of this chapter).

461. *The Anæsthetic*.—1. *Ether-air and ether-oxygen*.—A rich ether-oxygen mixture is more dangerous than a corresponding ether-air mixture and a very small spark suffices to cause ignition.

2. *Nitrous oxide*.—Although this gas is not itself inflammable, mixtures of ether vapour with air or oxygen are made not less, but even more inflammable if nitrous oxide is added.

3. *Ethyl chloride*.—This yields a vapour which forms an explosive mixture with air, and its use is dangerous in proximity to flames or apparatus likely to involve a spark or hot wires.

4. *Alcohol, chloroform, ether mixture*.—The ordinary A.C.E. mixture may yield an explosive mixture with air.

5. *Ethylene-oxygen*.—With this mixture the explosion resulting from ignition is very destructive.

462. Choice of Anæsthetic.—1. Explosion risks are not anticipated with the following anæsthesia :—

- (a) Basal narcotics.
- (b) Local analgesia.
- (c) Nitrous oxide.
- (d) Chloroform.

These may be used in their usual combinations and with oxygen.

2. Chloroform, however, is not always advisable, and if local anæsthesia is impracticable the risk of ether may be minimised by limiting its administration to the induction of anæsthesia. After an interval sufficient to ensure that all ether vapour has been practically eliminated, the use of electrical apparatus is admissible, anæsthesia being maintained with chloroform or nitrous-oxide-oxygen.

3. Risk of ether explosion may in general be lessened by the employment of a rigid closed circuit method of administration with carbon-dioxide absorption. Under such conditions with a tightly fitting mask no anæsthetic should escape into the air.

463. Anæsthetic Apparatus.—1. In some types of apparatus it is possible for an explosive mixture containing ether to be delivered although the valve or tap is set to admit chloroform or nitrous oxide only. This is due to evaporation combined with the slight suction effect of the gas flow, and its occurrence is more likely if the ether bottle is surrounded by a hot water jacket. In this type of apparatus, the casual emptying of the ether container is no safeguard but possibly an added danger. The ether bottle should be detached altogether and not replaced until all trace of ether has been removed, or it should be fitted with an effective valve which closes the outlet from the bottle when ether vapour is not required.

2. It has been established by experiment that ether-oxygen mixtures can ignite along a tube such as that employed in intratracheal administration or in conjunction with a mask. If ignition occurs at the outlet, therefore, flame may reach the ether bottle, causing a burst with ejection of burning ether.

3. Enclosed suction pumps should be so constructed that the exhaust delivery is outside the motor case ; otherwise in nose and throat operations it is possible to suck in the air containing ether until concentration within the explosive limits is reached.

464. Electrical Apparatus.—1. *Surgical Diathermy.*—Experience has shown that it is unwise to use diathermic apparatus if ether must be administered. The essential feature of this apparatus is the cutting arc or spark at the electrode which is definitely capable of igniting ether-air or ether-oxygen mixtures. The employment of a blanket or other form of screen between the patient's head and the point of application of the electrode is in no sense a reliable safeguard. Further risk of ignition arises from the spark gaps within the cabinet, and from the fact that the patient may be at an electrical potential, with consequent risk of sparking to the operator or other conducting bodies such as the table or anæsthetic apparatus.

2. *X-ray apparatus.*—Careful consideration of the electrical construction and method of connecting X-ray apparatus is essential if its use in the presence of an inflammable anæsthetic is required. Sparking may occur in consequence of a defect in insulation, at switches, regulators, fan cooling motors, or plug and socket connectors, the degree of danger depending on the ventilation and proximity to the patient.

3. *Surgical lamps.*—(a) These instruments must, in general, be of small dimensions, a fact which has led to a form of construction which, comparatively, is not robust and therefore tends to become unreliable with use. Sparking may be caused by accidental short-circuiting of exposed terminals, or may occur in consequence of defects such as failure of insulation or intermittent contact, and also at switches including those of the regulating type. Such sparking is particularly dangerous in connection with nose and throat operations where anæsthesia is maintained by ether-oxygen.

(b) It is very desirable that those concerned with the maintenance and use of surgical lamps should realise the explosion risk and endeavour to minimise it. The best designs may be rendered ineffective unless the maintenance is both careful and competent.

(c) The danger of ignition is less when small low voltage dry cells are used than where other forms of supply, such as accumulators, transformers, motor generators and large dry

cells are employed. In general, the voltage of the source of supply need not be appreciably more than that for which the lamp bulbs are rated, common values being 2·5, 2·7 and 3·5 volts.

(d) Grave risk of electric shock and sparking is introduced by the arrangement of a surgical lamp, in conjunction with a regulating resistance, for direct connection to public supply mains.

(e) These considerations apply also to lamps intended for attachment to the surgeon's head, and other forms of light projectors, the degree of risk depending on ventilation and the distance from the point of administration (or leakage) of the anæsthetic.

4. *Cauteries.*—In addition to the possibility of electrical sparking the heat of the cautery may in itself be sufficient to cause combustion of ether vapour. Ether-oxygen vapour will, under conditions quite compatible with those in which anæsthetists use such a mixture, ignite by contact with hot metal below visible red heat.

5. *General electrical installation.*—This term includes wiring, lighting and heating apparatus with the necessary switches and plug sockets. The risk of anæsthetic ignition, such as at a heater element, or in consequence of switch spark, or a defect, is again dependent on the ventilation and situation. Attention to these latter factors should result in material diminution of the danger.

465. Static Electricity.—Under ordinary conditions there is sufficient humidity in the atmosphere in the United Kingdom to prevent dangerous static electrification, but in exceptionally dry climates, or in theatres to which only warm air is delivered by a ventilating plant, the possibility of electrification and consequently of sparking is present. Insulated apparatus such as rubber-tyred patients' trolleys or portable anæsthetic equipments can be electrified in various ways, as, for instance, by drawing a dry blanket or towel across them. Such charges usually leak away after a few seconds, but discharge by sparking to the person or adjacent objects is capable of igniting ether-oxygen mixtures.

This source of danger may be eliminated by artificial humidification of the air. Where this course is undesirable it is advisable to earth insulated apparatus, such as rubber-tyred trolleys or operating tables, and in general a light trailing chain between trolley metal-work and a floor of "Granolithic" type will usually be effective.

Static electrification is readily discharged by earth connections, even those of comparatively high resistance, and this point is of some importance if it is considered undesirable, on account of shock risk, to introduce "dead" earthed apparatus into a theatre where current supplied from public mains is used.

466. Ventilation.—The first point for attention when risk of anæsthetic explosion is under consideration is the adequacy, or otherwise, of the ventilation. It may be possible to devise local means of extracting air and vapour from the immediate vicinity of the patient. This may considerably diminish general diffusion of anæsthetic vapour in the theatre, a point which, apart from reduction of explosion risk, may be of physical advantage to the surgical staff.

CHAPTER V

HIRED TRANSPORTS, FREIGHTSHIPS, HOSPITAL SHIPS AND CARRIERS, AUXILIARY VESSELS—RECORDS AND RETURNS TO BE RENDERED

SECTION I.—HIRED TRANSPORTS AND FREIGHTSHIPS

480. Definition.—1. "*Hired Transport*"—a ship engaged exclusively for Government service under time charter.

2. "*Freightship*"—a ship not exclusively so engaged but in which accommodation is engaged by the Government for a party (usually with a minimum number of 25 berths).

481. Inspection of a Ship before Fitting out.—When a ship is selected to be fitted out as a transport for the conveyance of airmen, it will be inspected by a board (consisting of representatives of the Board of Trade, Air Ministry and War Office) to determine the suitability of the arrangements on board as to sanitation, ventilation and accommodation for the sick, and to see that the ship is clean and in every way fit for embarkation. There will usually be a R.A.F. medical officer on the board. In the United Kingdom, the appointment of the R.A.F. medical representative will be made by the Air Ministry; abroad by the A.O.C. of the command in which the ship is to be fitted out. (The Board of Trade in the United Kingdom, and their local representative at a port abroad, is ultimately responsible for deciding as to the suitability of a vessel for transport work, but due consideration will be given to such objections or suggestions as may be made by the medical and other authorities on the special board.)

482. Inspection of a Ship before and after Embarkation of Personnel.—1. *First inspection.*—When 50 or more third-class passengers are to be conveyed in a transport or freightship, an inspection will be held before embarkation, at the port from which the voyage begins, to see that the fittings, sanitary condition and arrangements for the accommodation and messing of the Government passengers are satisfactory, and that the ship is clean and in every way fit for the embarkation. A medical officer, appointed for embarkation duties (the Embarkation Medical Officer), will be ordered by the Air Ministry, in the case of sailings commencing from home ports, and by the A.O.C. of the command concerned, when sailings commence at a port abroad, to attend the inspection; the Senior Medical Officer taking passage will also be in attendance. A report as to whether or not the arrangements made for the passengers are satisfactory in all respects will be prepared by the Board of Trade representatives, and signed by the representatives forming the board.

2. *Final inspection.*—A “final inspection” will be held after the passengers have embarked, and a report prepared and signed as in the case of the “first inspection”. The final inspection will be held at the last port of embarkation of the command (when there is more than one in the command). The inspection will be repeated when an important change of passengers takes place en route, *e.g.* at the terminal port on the outward voyage when the vessel is performing a round voyage. The inspections will not be required when there are less than 50 third-class passengers embarking. Details regarding the medical and sanitary requirements are laid down in H.M. Sea Transport Regulations, Appendices IX and X.

483. Medical Examination of Airmen’s Families.—Airmen’s families embarked in a freightship clearing a home port as an “Emigrant” ship (*i.e.* a ship carrying third-class passengers) are required, under the Merchant Shipping Act, to be medically examined at the ship’s side by a Board of Trade doctor, but this examination may be dispensed with on production by the embarkation medical officer of a certificate as to service medical examination within the previous 24 hours (*see* paras. 38 and 263).

484. Medical Inspection of Ship’s Crew.—The embarkation medical officer will ascertain from the Master of the ship that the crew are free from infectious disease. A medical inspection of the ship’s crew of a transport, and a sanitary inspection of the parts of the ship occupied by the crew, will be carried out at the beginning of each voyage by the embarkation medical officer in conjunction with the ship’s medical officer, when one is carried.

485. Medical Charge of Crew.—The S.M.O. is responsible for the sanitary and medical charge of the transport and crew, but when a ship’s medical officer is on board the S.M.O. will not interfere with the crew’s quarters or the medical treatment of the crew. The S.M.O. will frequently inspect the quarters occupied by the crew, and will call the attention of the Master and the Officer Commanding Troops to any neglect of sanitation.

486. Medical Inspections of Personnel. Embarkation and Disembarkation.—On the day following embarkation, personnel accommodated on the troopdecks will be inspected by a medical officer. An inspection will also be made on the day before disembarkation and cases of disease will be removed to their destination under medical supervision, and in accordance with instructions issued by the embarkation medical officer, or, if one is not appointed, by the embarkation officer.

487. Daily Inspection of Ship.—The S.M.O. will accompany the Master and the O.C. Troops on the daily inspection of the ship.

488. Inspection of Bilges.—The S.M.O. will frequently inspect the bilges and satisfy himself of their sanitary condition.

489. Hospital Accommodation in Hired Transports.—1. *Published accommodation.*—The accommodation provided for patients transferred to the United Kingdom on medical grounds, and reserved for cases arising during a voyage, will be published in Board of Trade Form T.560 (Accommodation on Transports) at the beginning of each trooping season. A copy of this form will be available on board each transport.

2. *Patients transferred to the United Kingdom on medical grounds.*—It is not practicable to allot to commands abroad accommodation for patients transferred to the United Kingdom on medical grounds in home-coming transports, and each command in succession, therefore, will embark such patients as may be awaiting evacuation, up to the accommodation remaining available, without encroaching on that reserved in the troop hospital and the women's hospital for cases arising during the voyage. In cases of grave urgency, however, it will be competent for the Air Officer Commanding to order the embarkation of a patient on his own responsibility, but in this case the O.C. Troops will be furnished with the order in writing for attachment to his voyage report.

3. *Cases arising during voyage.*—The accommodation reserved in the troop hospital for cases arising during the voyage is calculated to provide cots for not less than 1 per cent. of the number of troops which the ship is fitted to carry. When the maximum number of troopdeck passengers to embark falls appreciably below the total fitted accommodation, and the ship is not calling at an intermediate port, a corresponding reduction may be made in the cot reservation in the troop hospital for cases arising during the voyage.

4. *Encroachments.*—Normally, encroachments on the hospital cots reserved under the foregoing principles for cases arising during the voyage will not be permitted, but the S.M.O. may use his discretion in appropriating a limited number of such cots for additional cases to be embarked as patients transferred to the United Kingdom on medical grounds. In this matter he should have regard to their diseases and the number of vacant cots available, as well as the health of the troops and families on board, the length of the voyage, the climatic conditions to be expected during the remainder of the voyage, and any other considerations that affect the situation from a medical point of view.

5. *Canvas sling cots and screens.*—In the event of the troop hospital being full, canvas sling cots may be obtained from

the troop officer and utilized for any additional sick. Canvas screens may also be obtained from the same source in order to screen off additional space allotted for this purpose.

490. Isolation Hospital.—1. When not occupied, the isolation hospital and cabins for isolation attendants will be kept locked and the keys retained by the Master. When they are required for use, the keys will be handed over to the O.C. Troops and, when no longer required, returned to the Master.

2. The isolation hospital may be used for any infectious disease occurring on the voyage, and for all classes of passengers.

3. Should a case of infectious disease occur among the crew the hospital may be used, with the consent of the S.M.O. and O.C. Troops.

4. *Tuberculous patients* will not be taken into the isolation ward, but isolated elsewhere in the ship. Observation tuberculous patients will not be placed in the same quarters as tuberculous patients.

491. Medical Equipment.—1. *Method of demanding.*—Medical equipment as detailed in A.P. 132 (Scale G.1) will be issued to R.A.F. transports at the beginning of each trooping season in accordance with arrangements made by the Air Ministry (M.A.3), and placed on board under the direction of the embarkation officer (see K.R. & A.C.I., para. 932). Demands for subsequent voyages will be made out as detailed in para. 368, and forwarded by the S.M.O. of the transport direct to the Air Ministry in sufficient time to allow for packing and issue of the equipment.

2. *Accounting.*—Medical equipment will be taken on charge by the S.M.O. of the transport and accounted for in accordance with the instructions laid down in Chapter III. At the beginning of each voyage he will arrange for a complete check of all equipment, and on arrival at the port of destination a fresh stocktaking will be carried out and the account completed to show the balance in hand. If, at the end of the return voyage, any Forms 1230 are necessary in respect of final discrepancies, the forms will be rendered to the Air Ministry, for completion of section 3 or 4 as applicable (see para. 389, clause 2 (b)).

3. *Expendable equipment.*—Expendable equipment will be written off ledger charge when issued to the dispensary, a receipt being obtained from the N.C.O. in charge to support the ledger account.

4. *Vaccines, Sera and Calf Lymph* will invariably be kept in the ship's cold-storage room.

5. *Issues other than to service personnel.*—In the event of medical equipment being issued for the treatment of other than service personnel on board transports or freightships, a receipt will be obtained as a voucher to support the ledger account. If any financial recovery is necessary, receipts will be obtained in triplicate on Form 603.

6. *Transfer of charge.*—On a change of S.M.O. during the voyage, the officer taking over charge will satisfy himself that the articles in stock agree with the ledger balance. Ledger sheets need not be signed or initialled, but a certificate of correctness or otherwise of the equipment at the date of the handing over will be made out, signed by both officers, and attached to the ledger, after which the incoming officer will be held responsible for all articles and transactions.

7. *On termination of voyage.*—On completion of the voyage, whether at home or abroad, the medical equipment will be dealt with as follows :—

(a) When troops are to be embarked in the transport at the same port within a few days, and if the officer in medical charge of the transport is to remain on board for another voyage, the medical equipment will remain in his charge and arrangements will be made by him for its safe custody. Otherwise the medical N.C.O. on permanent duty in the ship will be responsible for the equipment during the time that no medical officer is available, and he will hand over the equipment to the Senior Medical Officer at the beginning of a voyage and will take them over again at its termination.

(b) When the transport is proceeding without medical personnel to another port to embark troops, the medical equipment will be checked, vouched, packed and handed over to the Master of the ship, who will be responsible for its safe custody until delivered by him to the officer assuming medical charge.

(c) When the transport is not being used further for the transport of troops, the medical equipment will be returned to the source of supply, accompanied by the ledger, unless instructions to the contrary are issued.

8. *Transports used by the R.A.F. for part only of the Trooping Season.*—When a transport is being employed by the R.A.F. for a part of the trooping season only, and by the Army for the remainder, it is usually arranged for medical equipment to be supplied from Army sources. In such a case, the R.A.F. medical officer in charge will not be responsible for rendering a demand for equipment for the subsequent voyage, but he will ensure that the necessary action is taken in regard to checking the medical equipment at the commencement and end of the voyage, and to keeping the ledger correctly.

When Army medical equipment is on board, a case of R.A.F. medical equipment is sometimes issued also from the R.A.F. Medical Store Depot, Hartlebury, for R.A.F. use if required. This latter equipment will be returned to Hartlebury at the end of the voyage, with any necessary certificates on Forms 1230.

492. Non-Medical Equipment.—1. Bedding for sick passengers accommodated in cabins will be supplied by the ship. For other sick personnel it will be supplied from service stocks held on board and will be taken on charge by the permanent medical N.C.O. (For scales of equipment *see* Regulations and Instructions for Sea Transport Services, Appendix 43.)

493. Medical Staff.—1. *Medical charge.*—(a) In transports, at least two medical officers will be detailed for medical duties. One medical officer only will be appointed on freightships if the numbers embarked justify this course (*see* para. 494). The appointment of a S.M.O. will be made by the Air Ministry in the case of sailings from home ports, and by the command concerned in the case of sailings from ports abroad.

(b) If, on board a transport or freightship, there is no R.N. or Army medical officer in charge of naval or army drafts, and there is a R.A.F. medical officer in charge of R.A.F. drafts, the R.A.F. medical officer will assume medical charge of the personnel of the other services embarked. (The converse rule applies if there is no R.A.F. medical officer in charge of R.A.F. drafts and a R.N. or Army medical officer is placed on duty for the voyage.)

(c) *Text Books.*—Medical officers will ensure that a reasonable number of personal text books are carried in an easily accessible part of their baggage when they proceed overseas by hired transport. Such books should invariably include Memoranda on Medical Diseases in Tropical and Sub-Tropical Areas.

2. *Employment of other medical officers travelling.*—Should the S.M.O. require the services of other medical officers who are taking passage, the latter will be held to be available for duty during the voyage provided they are junior in rank to the S.M.O. and are in receipt of full pay for the whole of the voyage. Medical officers returning home on retirement or on being placed on half pay will not be placed on duty if they are not in receipt of full pay during the voyage. Medical officers on leave under India rules or embarked as indulgence passengers will not, unless absolutely necessary, be detailed for duty, and officers of the Indian Medical Service will only be placed on duty in cases of extreme emergency.

3. *Hospital personnel.*—(a) On R.A.F. transports, one flight sergeant (employed as dispenser and for duties in the ship's hospital) and one corporal or L.A.C. (medical orderly) will

be appointed as permanent staff. Additional staff required to carry out medical duties will be drawn by the S.M.O., as necessary, from airmen of the medical branch taking passage.

(b) *Attendants for mental patients.*—A sufficient number of attendants will be detailed to take charge of mental cases and the O.C. Troops will, in consultation with the S.M.O., arrange for the exercise of the latter (see para. 503).

(c) *Leave ashore.*—Personnel employed on medical duties will not be permitted to go ashore at an intermediate port without the authority of the S.M.O. in addition to that of the O.C. Troops.

4. *Freightships.*—If, in a freightship, there are less than 250 third-class adult berths occupied and no service medical officer is taking passage, the ship's surgeon will be directed in writing by the Board of Trade to take medical charge; if the service party is less than 25, the ship's surgeon will, in the normal course of his duty, render any medical attendance required.

494. Accommodation for the Senior Medical Officer.—A cabin will be reserved exclusively for the use of the S.M.O. on a transport, and on a freightship when 250 or more berths are occupied by adults. If he is accompanied by his wife, she will share the cabin allotted to him if it contains two or more berths. If, however, he and his wife are accompanied by a child or children under 10 years of age, he may elect that his wife shall be accommodated in another cabin with the child or children, in which case the officer may be allowed to occupy the cabin for his sole use.

495. Members of the Nursing Services.—1. *Liability for duty.*—Members of the nursing services will be available for duty as required and will be in possession of their uniform for this purpose. If a transport is employed as a cot-ship from India, two members, if available, will be appointed for the round voyage, otherwise members as necessary, travelling under trooping arrangements will need to be detailed by the R.A.F., R.N. or Military authorities for duty on the homeward voyage. Reserved cabin accommodation will be provided on a cot-ship for the use of the sister on night duty on homeward voyages (see A.P. 1075, para. 9).

2. *Indulgence passengers detailed for duty.*—Any member of the R.A.F., R.N., or Army nursing services embarked in a transport as an indulgence passenger may be placed on duty during the voyage if, in the opinion of the S.M.O., her services are necessary for the efficient nursing of the sick. The S.M.O.

will give the Master a copy of the order placing the passenger on duty, and will give the embarkation officer at the port at which the indulgence passenger disembarks a certificate showing :—

(a) The exceptional circumstances in which the member's services were required ;

(b) The nature of the duty and the period covered by the duty ;

(c) The orders of the O.C. Troops placing the member on duty.

3. *Accommodation.*—Nursing sisters will be accommodated in cabins together, whenever possible, and not with other ladies, nor with children unless absolutely unavoidable.

496. Accommodation for Permanent Hospital Staff.—Accommodation for four members of the permanent medical staff is provided in the troop hospital.

497. Medical Attendance on Members of Crew.—No charge will be made for services rendered in the event of a medical officer being called upon to attend a member of the crew. The troop hospital will be used for their treatment if necessary.

498. Venereal Disease.—1. *Accommodation in hospital.*—Venereal disease cases will, as a rule, be accommodated in the troop hospital, whether they arise during the voyage, are embarked as patients in a transport employed as a cot-ship, or are specially embarked under the rules governing the embarkation of patients in ordinary transports.

2. *If hospital accommodation is not available*, venereal cases may be accommodated on the troopdeck in a part set aside for them. They will mess together, and will use only the mess utensils set apart for this purpose. (All-metal utensils are stamped with a " V ", earthenware utensils are marked with a red band burned in during manufacture, and the handles of bone mustard spoons are stained red.) These messes will be inspected daily to see that the special utensils only are in use.

3. *Special washing places and latrines* will be set aside for those suffering from venereal disease.

4. *Embarkation, accommodation and messing.*—Venereal cases will be embarked, accommodated, and messed under the same conditions as other troops and airmen.

5. *Hammocks and bedding.*—These will be disinfected before disembarkation is completed (*see para. 517*).

499. Hospital Patients' Valuables.—Valuables will be tied up securely, labelled by the S.M.O. and deposited in the O.C.'s safe for custody during the voyage.

500. Dieting of Patients.—1. *Ordinary diet.*—The dieting arrangements for patients will be as for a non-dieted sick quarters. For suitable cases, ordinary rations will be drawn, but patients unable to eat the ordinary diet will be subsisted on medical comforts drawn in accordance with H.M. Sea Transport Regulations, Appendix XLI. Patients will not be struck off messing on admission.

2. *Medical comforts supplied by the ship.*—(a) *General.*—The scale of medical comforts which shipowners are required to supply without extra charge for the use of third-class patients on board transports and freightships is shown on Board of Trade Form T.194 (see H.M. Sea Transport Regulations, Appendix XIX).

(b) *Demands.*—Supplies are in the custody of the Master, and will be issued by him as required for third-class patients during the voyage on the requisition in duplicate on Form 773 (Army Form A.B.30) by the Senior Medical Officer. The form will be signed by the S.M.O., the duplicate copy being retained as a check against Board of Trade Form T.462. Separate forms will be made out for R.A.F., R.N., and Army personnel respectively. Medical comforts issued outside the scale will not be demanded except in special circumstances; the Master will then require the S.M.O. to furnish him, at the termination of the voyage, with a certificate on Form T.462 that they were issued to third-class patients. In order to obtain the day's supply of comforts as early as possible, the requisition will be handed to the chief steward the evening before.

(c) *Accounting.*—All issues of medical comforts will be recorded in a Medical Comforts Ledger and scrutinized and initialled by the S.M.O. daily.

(d) *Replacement of stock.*—Should it be considered by the S.M.O. that the stock of medical comforts on board is insufficient for the remainder of the voyage, he will report the matter to the O.C. Troops, who will request the Master to take steps to obtain the necessary further supply at the next port of call.

(e) *Reporting of numbers off rations.*—The S.M.O. will give daily notice to the Master of the number of third-class patients to be subsisted on medical comforts and for whom rations will not be required on the following day.

(f) *First- and second-class passengers.*—The S.M.O. will sign no certificates for wines, spirits or other liquors, or for medical comforts supplied to first- and second-class passengers on his recommendation, as these passengers are required to pay for



any intoxicants they consume, while medical comforts will be supplied by the Master as part of, or in lieu of, the ordinary saloon fare.

501. Supply of Milk.—In hired transports there are ample supplies of emulsified milk available throughout the voyage for infants and young children. Supplies of most of the popular tinned milks and special foods are also carried.

502. Items Purchased for Mental Patients.—Such items as cigarettes, tobacco, soap, etc., required for mental patients will be purchased at the discretion of the S.M.O. who will requisition on the Officer Commanding Troops for the cash required.

503. Mental Patients' Exercise.—All transports fitted for the conveyance of mental cases will be supplied with netting sufficient to close entirely the space on the upper deck set apart for their exercise. This netting will invariably be spread before the patients are exercised. An orderly will be in constant attendance, as well as a member of the ship's guard (*see also* para. 493, clause 3 (b)).

504. Documents of Patients Transferred to the United Kingdom on Medical Grounds.—All relevant medical documents for patients embarked in hired transports or freightships, in which there are service medical officers in charge, will be handed over to the S.M.O. at the time of embarkation and will be delivered by him to the embarkation officer at the time of disembarkation for forwarding to the Air Ministry. (In the case of Army personnel, the medical history sheets will be handed to the Officer in charge of the unit or draft concerned.)

505. Kit and Baggage of Patients transferred to the United Kingdom on Medical Grounds.—The kit and baggage of patients transferred to the United Kingdom on medical grounds will be stowed separately from that of other troops.

506. Emergency Signal.—On sounding of the emergency signal on board, such medical officers and nursing orderlies as are detailed for hospital duty will proceed to the hospital and prepare to move the sick, including mental cases, to the place allotted to them on the upper deck. If at any time the number of patients is such that the medical personnel is insufficient to move them speedily, the O.C. Troops will arrange for additional men to assist. Cot cases will be placed in the allotted boats under the directions of the S.M.O.

507. Vaccination and Inoculation.—1. *Outward Voyage.*—An inoculation and vaccination state of all drafts in the ship, including women and children, will be in the possession of the

O.C. Troops, and an inspection of this will show the unprotected individuals, all of whom will be urged to avail themselves of the protection afforded by vaccination and inoculation. A certain number may give a recent history of inoculation or vaccination without documentary evidence in support of this; the S.M.O. will use his discretion as to action in each particular case. Every effort will be made to complete all inoculations before arrival at Port Said.

2. *Cholera inoculation.*—Inoculation against cholera will not be performed unless special instructions are issued by higher authority.

3. *Homeward Voyage.*—No inoculation should prove necessary, but vaccine and lymph are available in case of need.

4. *Return of inoculation and vaccination.*—An inoculation and vaccination state, on Form 1926, for all drafts disembarking at each port of call, will be rendered to the competent medical authority of the command concerned, and a copy sent to the Air Ministry. (See K.R. & A.C.I., para. 937.)

508. Births and Deaths.—These will be notified promptly in writing to the Master by the S.M.O. for insertion in the log. If circumstances render necessary the burial at sea of a government passenger, whose death has taken place on board, the crew will perform undertaker's duties.

509. Purchase of Fruits Oversea.—The purchase of fruits, other than those which can or have to be peeled, will not be permitted. Fruit purchased in this manner is not uncommonly the direct source of introduction of such diseases as dysentery and typhoid fever, and it is essential that none be eaten unpeeled.

510. Lectures on the Care of Health Overseas.—1. A series of lectures on the care of health overseas will be delivered to all ranks on outward voyages. It is more important to give elementary details which can be frequently repeated, than to cover a considerable amount of ground without repetition. Forty-five minutes for each lecture is sufficient. Four lectures at least should be given and, if the voyage permits, this number may be increased.

The following outline is suggested :—

(a) *First lecture.*—Give a quick sketch of the nature of the country to which the troops are going; explain hot and cold weather, atmospheric humidity, the difference between temperate and tropical climates, and between plain and hill stations; the inhabitants and their customs; the high incidence of venereal diseases among native prostitutes abroad. Having

got the men interested, the remainder of the lecture should be devoted to emphasizing the importance of the "Three golden rules of the tropics" :—

- (i) Keep the abdomen covered when lying down.
- (ii) Keep the bowels open.
- (iii) Never drink intoxicants before sundown.

(b) *Second lecture.*—Repeat the "Three golden rules of the tropics". Explain that the diseases encountered in warm climates are of three main kinds :—

- (i) Those transmitted by contaminated food and drink.
- (ii) Those transmitted by insect bites.
- (iii) Those due to heat effects.

Devote the rest of the lecture to (i) above.

With regard to food, emphasize the danger of eating rindless fruits and uncooked vegetables. With regard to drinks, explain the importance of drinking water and mineral waters from approved supplies only. Describe the symptoms and effects of bacillary dysentery and cholera, so as to press home the need for a safe food and water supply.

(c) *Third lecture.*—Repeat the "Golden rules" and go into the subject of insect-borne diseases, *e.g.* malaria, sandfly fever, dengue, leishmaniasis and filariasis. Lay stress on the proper use and care of mosquito nets, the wearing of slacks after sundown, and the use of insect deterrents, such as Bamber oil or Sketofax.

(d) *Fourth lecture.*—Explain the seriousness of heatstroke and sunstroke. Describe the elementary first-aid treatment of heatstroke, *e.g.* strip naked ; place in the shade in circulating air ; sprinkle body with cold water and fan, preferably while cradled with damp sheets. Stress the fact that constipation and alcoholism are common predisposing factors. Bilharziasis should be referred to, and the possibility of this disease being contracted whilst bathing in infected water should be explained. Conclude with a résumé of all four lectures.

2. In the case of long sea voyages, such as to India, Iraq, or the Far East, further lectures in field training should be given. These health lectures help to pass the time and are a very valuable means of obtaining the co-operation of all ranks in camp sanitation and hygiene. This co-operation is of prime importance in the maintenance of health in warm climates. Suitable lectures to give, in addition to those outlined above, are as follows :—

(a) *Fifth lecture.*—Diseases in relation to service life ; the prevention of these diseases. Flies :—Their life history and habits ; diseases conveyed by flies, *e.g.* diarrhoea, dysentery, enterica, cholera. Construction and care of urinals and latrines.

(b) *Sixth lecture.*—Résumé of preceding lecture. Disposal of all waste material—barracks refuse, food and excreta. Construction and working of incinerators.

(c) *Seventh lecture.*—Résumé of preceding lecture. Water supplies: drinking and ablution water. Diseases conveyed by water—cholera, enterica, bilharziasis. Ammonization and chlorination of water. Horrock's test. The working and care of a water trailer. Care of the water bottle. Again refer to the importance of drinking water and mineral waters from approved supplies only.

(d) *Eighth lecture.*—Résumé of preceding lecture. Prevention of venereal disease. Value of cleanliness; skin diseases; prevention of heat effects. Construction of ablution benches and shower baths. Conservation of water. Disposal of sullage water. Construction of grease traps.

(e) *Ninth lecture.*—Résumé of preceding lecture. Food supplies and the value of vitamins. Diseases conveyed by dirty or improperly cooked meat and vegetable foods—tapeworms, roundworms, flukes and cholera. Food storage. The danger of bazaars. The proper control of messes and cookhouses, especially as regards flies and cleanliness. Again refer to the danger of eating rindless fruits and uncooked vegetables abroad.

(f) *Tenth lecture.*—Résumé of preceding lecture. Fleas; lice; rats; their habits, and diseases conveyed by them—plague, typhus, relapsing fever, trench fever. Disinfection; the care and working of a portable disinfectant. Camp sanitation as a whole.

511. Drinking Water.—Drinking-water tanks will have their contents chloraminated or chlorinated, if it is considered necessary, with one part per million of free chlorine allowed to act for at least half an hour before the water is used.

512. Wearing of Helmets and Pith Hats.—The O.C. Troops, in consultation with the S.M.O., will decide when helmets and pith hats shall be taken into use by service personnel and their families, and orders will be issued accordingly.

513. Assistance by Service Personnel in the Engine Rooms of Hired Transports.—The Master has authority to arrange with the O.C. Troops for volunteers from the personnel embarked to assist the engine room complement if it is found necessary for any reason to increase the speed of the ship beyond the normal. Volunteers only will be accepted for this purpose when the S.M.O. certifies that their health will not be injured thereby.

513A. Notification of cases of sickness to Master of Vessel and Ship's Surgeon.—The Master of a vessel and the ship's surgeon, if one is carried, are responsible by Statute for rendering a true account of the state of health of all persons on board to the Health Authority at any port of call in the United Kingdom, and are responsible to much the same degree in many ports abroad. The S.M.O. or medical officer in medical charge of troops should inform immediately the ship's surgeon and keep him constantly informed of all cases of sickness and should act in close collaboration with him in all matters concerning the state of health of troops on board and of the intention to discharge on shore or to hospital any cases which come under his immediate care.

514. Landing of Patients en Route. Serious Illness or Epidemic.—1. *Procedure.*—In the event of serious illness or an epidemic of infectious disease necessitating a call at the nearest port to land patients, the S.M.O. will request the O.C. Troops to hand to the Master a written request for the ship to be diverted to the port required. If no danger to the ship is involved, the Master will accept this request as authority for the diversion, but, if he considers such diversion dangerous to the ship and the lives of those on board, he will represent this to the O.C. Troops in writing. If, in spite of this, the O.C. Troops (on the advice of the S.M.O.) still considers the landing of the patients to be imperative, the Master will carry out the diversion, except in cases where in his opinion the danger to the ship and the lives on board is so serious as to outweigh the advantage of landing the patients.

2. *Notification of landing.*—When the port of disembarkation has been decided, the S.M.O. will signal through the O.C. full details to the competent medical authority of the command concerned in order that the necessary arrangements for disembarkation and admission to hospital may be made. If the disembarkation necessarily takes place at short notice at a port (e.g. Colombo) at which R.A.F. hospital medical services are not available, the S.M.O. will communicate similarly with the S.M.O. of the Naval or Military hospital to which the patient is required to be admitted, repeating the message to the competent medical authority of the command. If, in exceptional circumstances, the Master is ordered to divert the ship into a foreign port (e.g. Lisbon) for hospital treatment of a seriously ill case, the necessary medical aid will be arranged through the Master. In either of the above alternatives, a report of the arrangements finally made will be sent by signal to the Air Ministry.

3. *Landings in Egypt.*—When patients, too ill to continue their sea journey, are to be landed in Egypt, they should be disembarked at Port Said (where landing facilities are more

suitable than elsewhere) rather than at Suez, unless the extreme urgency of their condition necessitates the latter course. The assistance of medical officers, personnel or equipment can be afforded, if necessary, as the vessel passes the Military Hospital, Moascar. Disembarkation at Lake Tismah of seriously ill patients for admission to Moascar Military Hospital inevitably entails exposure and discomfort to the patient, and should be resorted to only in grave emergency. In such cases full particulars will be notified to the Sea Transport Officer i/c Egypt and "Egypforce Cairo" by signal as early as possible.

4. *Special equipment provided.*—A special stretcher for landing sick is provided in each transport, and a crane or derrick for hoisting will be made available by the Master should the S.M.O. require this to be done.

515. Advance Notification of Patients.—1. In order that arrangements may be made for the disposal of patients on disembarkation, the following signal will be required by the O.C. Troops for transmission to the Air Ministry when the vessel passes Gibraltar on the homeward voyage:—

A.	No. of officers	Cot.	Non-cot.
B.	" " nursing sisters	"	"
C.	" " soldiers	"	"
D.	" " women	"	"
E.	" " children	"	"
F.	" " mental cases	"	"
G.	" " venereal cases	"	"
H.	" " naval and marine personnel	"	"
J.	" " airmen	"	"
K.	" " civilians	"	"
L.	" " tuberculosis cases	"	"
M.	" " sick transfers (other than patients transferred to the United Kingdom on medical grounds).	"	"
N.	" " families accompanying patients transferred to the United Kingdom on medical grounds.		

2. The number of cases shewn under F.G.L. and M. will not be included in those given under any other letter, but sent separately prefixed by the appropriate letter, *e.g.* JL4 indicates "other ranks (airmen) tuberculosis 4" in addition to the numbers of other ranks shewn under J.

3. Specimen signal.

"Air Ministry repeat Rafshipper Southampton."

"Patients, etc., Cot A.5, B.1, J.17, J.M.1, D.1, AF.2, E.L.1 (etc.).

Non-cot A.2, J.29, JGM.3, D.2 (etc.)."

516. Notification of Infectious Disease.—1. An outbreak of infectious disease will be notified by signal to the Embarkation Medical Officer if it is considered that he will be required to arrange for the disposal of cases or their contacts on the arrival of the ship. The number of immediate contacts occurring in each family to be disembarked will be stated.

2. In the event of mild infectious disease such as measles, German measles, chicken pox, etc. a nominal roll (in triplicate) giving full particulars of patients and contacts (including crew), with the intended addresses of the latter, will be prepared and handed to the Embarkation Medical Officer.

3. When smallpox, typhus, cholera, plague, yellow fever, cerebro-spinal fever, malaria of malignant type or any other infectious disease notifiable in the United Kingdom (of which information is in possession of the Master of the ship) occurs in a transport, freightship, hospital ship or carrier bound for the United Kingdom, it will be reported as early as possible to the Air Ministry by signal. Nominal rolls of all effective service personnel and families proceeding direct to their homes will be prepared in duplicate, stating the last date of contact and the address in the United Kingdom to which each person is proceeding. (Addresses from which correspondence will be re-directed will not be sufficient.) These rolls will be handed to the Embarkation Officer at the port of disembarkation. Where smallpox occurs, the rolls will state the last date of vaccination, whether it was successful, and, if not, the last date on which a successful vaccination result was obtained. All nominal rolls will be accompanied by a detailed statement giving full particulars of the outbreak of the disease.

517. Disinfection.—1. *The personal clothing* of all infectious cases admitted to the troop hospital will be disinfected.

2. *The bedding, hospital clothing and utensils* used by the sick will be disinfected in the ship's disinfector directly the patient is discharged from the troop hospital. Soiled articles of bedding will then be returned to the Master for washing, and fresh stocks obtained in lieu.

3. *Cabins and troop decks* will be disinfected as indicated for quarters and barrack-rooms (*see paras. 656 and 657*).

4. *Holds and bilges* will be disinfected by the Port Health authorities.

5. *Certificate of disinfection.*—In the case of infectious disease the Embarkation Medical Officer will require a certificate that all bedding and personal effects of infectious patients have been disinfected with steam, that the wards and cabins have been sprayed with formaldehyde solution, and that all articles capable of conveying infection have been

disinfected on board, handed over to the sanitary authorities at the port of disembarkation, or destroyed, as the case may be. (See K.R. & A.C.I., para. 1024.)

518. Disembarkation Procedure for Hired Transports and Freight Ships.—1. *The Embarkation Officer and the Embarkation Medical Officer* will board the vessel either before or at the time she berths and will proceed, with the S.M.O., to make all necessary arrangements for disembarkation.

2. *Documents.*—The S.M.O. will hand over to the Embarkation Medical Officer all returns, forms and documents detailed in para. 550.

3. *Preparations for disembarkation.*—The S.M.O. will see that all sick personnel with their kits and baggage, are ready for disembarkation by the time the ship berths. Where a lift is fitted, he will arrange that the hatchway over it is open and that there is a clear passage way for stretchers to the nearest gangway.

4. *Order of disembarkation.*—The usual order of disembarkation will be :—

(a) Patients able to carry their kit (they will be paraded in the shed on the landing stage with their kit bags and baggage).

(b) Women and children.

(c) Cot cases.

(d) Mental patients. (Care will be taken that they are properly dressed.)

5. *Clothing to be worn by patients.*—Cot cases will not be dressed in uniform, but in hospital clothing ; ships' pillows and blankets will be taken as far as the train if necessary. Great-coats will be worn by " B " class patients (see para. 59).

6. *Patients not fit to travel.*—(a) Patients who are not fit to travel and who are entitled to hospital treatment will usually be transferred to the nearest service hospital unless other arrangements have been made prior to disembarkation.

(b) *Patients proceeding to the Royal Victoria Hospital, Netley.*—These patients will have in their haversacks or on their person the following articles :—

1 service cap.	1 comb.
1 pair boots	1 razor.
Blackening brushes.	1 shaving brush.
1 clothes brush.	1 tooth brush.
1 hair brush.	Devotional books (if provided).

These articles will not be placed in the kit bag.

7. *Patients fit to travel.*—R.A.F. patients are normally transferred as follows :—

(a) Officers to the Officers' Hospital, Uxbridge.

(b) Airmen to Princess Mary's R.A.F. Hospital, Halton.

Personnel of the Royal Navy or Army are normally transferred to the nearest naval or military hospital respectively.

8. *Mechanical transport.*—An officer in charge of patients will obtain from the S.M.O. a certificate that the men for whom conveyance by taxicab is required are unable to proceed by ordinary local conveyance (*e.g.* bus or tram). If men are proceeding without a medical officer in charge and need a taxicab en route the embarkation officer will, if necessary, advance the fare. Taxicabs will not be used if service mechanical transport can be made available at the requisite points en route.

9. *Customs declaration forms.*—These forms will be completed and signed by owners of baggage, whether they are in possession of dutiable articles or not. The forms, and the necessary keys for opening locked bags, etc., will be handed to the embarkation officer. Baggage of mental patients, who are incapable of making a valid declaration or of other patients who are not in a fit state to make a declaration, will be dealt with by the embarkation officer.

10. *Baggage.*—The embarkation officer will arrange the landing of all baggage. The baggage of sick personnel will accompany them to hospital, except in the case of officers whose heavy baggage will be sent to No. 1 R.A.F. Depot, Uxbridge, for storage. Other baggage, not available at the time of disembarkation, will be disposed of by the embarkation officer.

11. *Medical officers conducting parties of patients.*—These officers will take with them—

(a) Medical documents.

(b) Patients' valuables.

(c) Mental patients' effects with a list thereof in duplicate.

(d) Separate rolls in duplicate of—

(i) R.A.F. personnel,

(ii) All others (*i.e.* families, civilian officials and employees).

They will be responsible for the safe custody of documents, baggage and valuables sent with the party and they will not leave their parties until they have delivered them over at their destination, obtained receipts for documents and valuables, and received permission to depart.

12. *Medical personnel to remain on board.*—The S.M.O. and, if there should be 120 patients, one medical officer in addition will be required to remain until disembarkation, etc., is completed (if the number exceeds 200, a third medical officer will be required).

The medical staff will not leave the ship until all patients or other personnel with whom they are concerned, have been disembarked, records and returns completed, equipment charge cleared, hospital dispensary and wards cleaned and left tidy, clothing, etc., disinfected, and any other matters requiring attention dealt with. If these details tend to prolong unduly the detention of some of the personnel on board, arrangements for completing the duties will be made with the Embarkation Medical Officer and Embarkation Officer if this is convenient to them.

519. Senior Medical Officer's Report.—Each S.M.O. will compile a report at the end of his period of duty, the last S.M.O. (where there has been more than one during an outward or homeward voyage) rendering a report covering the whole voyage to the C.O. The report will include recommendations with regard to the medical equipment, accommodation, sanitary arrangements and any special points he considers should be brought to the notice of higher authorities.

SECTION II.—AUXILIARY VESSELS

525. Auxiliary Vessels.—1. *Scale.*—Medical equipment will be supplied to R.A.F. auxiliary vessels in accordance with the appropriate scale in "Merchant Shipping: Medical Scales" issued by the Board of Trade. A suitable cabinet will be provided if necessary.

2. *Issue.*—The equipment will be issued in the first place from the medical unit at the base for the particular vessel. In issuing the equipment, the expendable items will be accounted for by the unit as having been expended, but the non-expendable items will be issued on quasi-permanent loan. A receipt for these latter items will be obtained from the Master of the vessel on Form 668, which will be held by the medical officer of the unit to support the corresponding articles held on charge by him.

3. *Losses and breakage.*—Any losses or breakages will be reported by the Master to the medical officer for replacement, and the medical officer will take write-off action as in the case of his own equipment.

4. *Replacement.*—Further quantities of consumable equipment will be issued on the Master of the ship certifying that it is required to replace that which has been properly consumed in R.A.F. service. Local purchase will be confined to essential replacements when the vessel is out of reach of R.A.F. units.

5. *Return of equipment on vessel paying-off.*—In the event of the vessel paying-off, all equipment will be returned to the issuing medical officer, who will take on charge the items that are expendable and clear the loan account in regard to those that are non-expendable.

SECTION III.—HOSPITAL SHIPS AND HOSPITAL CARRIERS

530. Definition.—1. *Hospital ship.*—A ship fitted out and employed exclusively for the care and transport of sick and wounded.

2. *Hospital carrier.*—A ship temporarily adapted for the conveyance of sick and wounded, pending the availability of a hospital ship.

3. *Ambulance transport.*—A vessel which, used on the outward voyage for the transport of troops, is fitted for the homeward voyage either partly or wholly to carry sick and wounded. It has no distinguishing marks denoting the latter purpose and can claim no protection under the Geneva Convention. (See A.P. 1301.)

531. Fittings.—If the erection of hospital fittings in a hospital carrier cannot be completed before the ship leaves port, the necessary mechanics will proceed with her and continue the work at sea. A hospital ship will be fitted completely before she leaves port. While at sea, the ship's crew will maintain in an efficient condition all special hospital fittings on board. The ship, deck and cabins will be kept clean by the crew.

532. Medical Officers.—These ships will not carry a ship's surgeon, and any medical attendance required by members of the crew will be given by the service medical staff, no payment for such service being expected from the owners or Masters of the ships.

533. Duties of Medical Staff.—The hospital staff will be responsible for attendance on patients, for the cleaning of the hospital wards, and for laundry work.

534. Assistant Staff.—The medical staff will be assisted by a limited number of the crew to be carried specially and placed at the entire disposal of the Senior Medical Officer.

535. Medical and Dental Equipment.—Arrangements for the supply of medical and dental equipment will be made by Air Ministry (M.A.3).

536. Non-medical equipment.—Mess utensils and miscellaneous articles (detailed in H.M. Sea Transport Regulations, Appendix XL) will be supplied by the owners of the hospital

ships, but will be paid for by, and ownership vested in, the Government. An inventory of these articles will be taken by the S.M.O.

537. Diets.—The owners will arrange for the feeding of the patients and provide medical comforts in accordance with the Diet Scales shown in H.M. Sea Transport Regulations, Appendices XLI and XLII respectively. Payment for these supplies will be made by the Government.

538. Bedding.—Bedding for the use of the staff and patients berthed in cabins will be provided by the owners. Other bedding required, including that for use in the wards, will be supplied by the Air Ministry, and the Master will be required to take it on charge and account for it. (See H.M. Sea Transport Regulations, Appendix XLIII.)

SECTION IV.—MEDICAL RECORDS AND RETURNS TO BE RENDERED BY R.A.F. TRANSPORTS

550. General Instructions.—1. *Forms 38.*—Separate Forms 38 will be used for the following :

(a) R.A.F. personnel.

(i) Admitted during the period of the voyage.

(ii) Patients transferred to the United Kingdom on medical grounds, whether admitted to sick quarters or not. " Nil " returns are required.

(b) Army personnel.

(c) Navy personnel.

(d) All others.

Only one Form 38, for each class of patient shown above, will be rendered for the complete outward or homeward voyage.

2. *For R.A.F. personnel.*—(a) Forms 39 and 41 will be compiled for R.A.F. personnel as laid down in para. 256).

(b) All statistical forms, on completion, will be forwarded to the Under Secretary of State (M.A.3), Air Ministry by the last S.M.O. on the homeward voyage.

(c) At the conclusion of the trooping season all Forms 41 will be forwarded to the Under Secretary of State (M.A.3), Air Ministry.

(d) At the port of disembarkation in the United Kingdom, the following nominal rolls will be prepared and handed to the Embarkation Medical Officer.

(i) Nominal roll of sick. Separate rolls for officers, mental cases, women and children, patients transferred to the United Kingdom, sick among the drafts on board, cases of infectious disease, and of venereal disease, showing the disposal of each case.

(ii) Nominal roll of women and children not sick but accompanying sick husbands. (To include all women and their children who may be required, by the Embarkation Medical Officer, to accompany their husbands to hospital.)

(iii) Nominal roll of husbands accompanying sick wives and children. (To include all airmen who may be required, by the Embarkation Medical Officer, to accompany wives and children to hospital.)

(e) At the port of disembarkation abroad, a nominal roll of sick, indicating the disposal of each case, will be prepared and handed to the Embarkation Medical Officer for transmission to the competent medical authority of the command concerned.

(f) With regard to special nominal rolls required for infectious cases by the Embarkation Medical Officer and the Port Sanitary Authority, *see* para. 516.

3. *Army personnel*.—(a) Returns of sick on Army Form B.182 will be compiled to cover the periods from the day of embarkation to the day preceding disembarkation. The form will be completed as follows :—

(i) Outward voyage—1 copy.

(ii) Homeward voyage—2 copies.

(b) Nominal roll of patients on Army Form A.36 (a)—5 copies.

All cases of sickness occurring among personnel and their families during the voyage, whether admitted to hospital or only attending, will be accounted for in the columns headed "Cases on voyage". All invalids embarked as such, and all other sick transfers, including all cases of venereal disease, whether accommodated in the ship's hospital or not, will be accounted for in the columns headed "Invalids".

(c) Nominal roll of infectious cases—3 copies.

(d) Infectious disease notification—3 copies.

(e) Report of cases of typhoid fever on A.F. I.3056—3 copies.

(f) Death certificates—2 copies.

(g) Nil Returns—1 for each voyage.

(h) Hospital case cards, A.F. I.1220 (R.A.F. Form 39).

4. *Personnel of the Royal Navy*.—(a) (i) Form M.179—Cover for Medical Officers Journal.

(ii) Form M.179 (a)—Case sheets for Important cases only.

(iii) Form M.179 (*g*)—Alphabetical Sick List.

(iv) Form M.179 (*h*)—Alphabetical List of Minor Injuries.

(b) The returns will be compiled to cover the periods from the day of embarkation to the day of disembarkation, distinction being made between—

(i) Naval personnel proceeding on or returning from service abroad.

(ii) Invalids, embarked as such, returning to England.

(iii) Sick and wounded transferred from the fleet.

(c) Notations will be made on Medical History Sheets and other medical documents in the event of—

(i) Ratings falling sick on passage ; and

(ii) Invalids (and sick and wounded from the fleet) receiving treatment while on passage.

These documents will be addressed to the medical officer of the ship, hospital or establishment to which the personnel are disposed on disembarkation (*see* K.R. & A.C.I., para. 1004).

(d) Stocks of Naval forms, if not available on board a troopship, will be supplied, on demand, by the Senior Naval Officer or Naval Medical Officer of the port of embarkation.

5. *Disposal of returns, forms and documents.*—All returns and documents will be handed to the Embarkation Medical Officer, Southampton, or his representative on his arrival on board (*see* para. 518.)

CHAPTER VI

THE PSYCHOLOGICAL AND PHYSIOLOGICAL
ASPECTS OF AVIATION

SECTION I.—GENERAL CONSIDERATIONS

574. It is important that all medical officers shall be able to decide whether an individual is fit for flying. Ordinary clinical methods of examination are used for this purpose, supplemented by certain special tests, of which the examination of fit and successful flying officers formed the original basis. These tests are detailed in A.P. 130.

In respect of capacity for flying, it may be laid down as a general principle that physical fitness is within the province of the medical branch, while flying skill is within that of the general duties branch. Since, however, both are necessary for successful flying, it is obvious that the closest co-operation must exist between the two branches, and frequently will it be found that only after careful consultation between the two can the cause of a subject's non-effectiveness be elucidated.

The advice of a medical officer, well grounded in the principles of aviation medicine, can be of the greatest value to a C.O., since it is as much a medical officer's duty to report a man as fit to fly as to recommend his being excused from flying duties.

Flying duties necessitate—

The guidance and control of an aircraft moving in all three dimensions of space at considerably higher speeds than those otherwise experienced by the human body ;

The performance of manœuvres submitting the pilot to the effects of rapid rotation in a position of instability ;

The attainment of great heights, sometimes with exposure to extreme cold and the effects of diminished oxygen pressure ; and

Combatant service.

The primary function of the medical officer is to keep the officers and men under his charge fit for their full duty ; the care of the sick and injured, though no less important, is a secondary function. With this principle in view the medical officer cannot faithfully carry out his duty unless he identifies himself with the life, and not merely the official duties, of the R.A.F. in every way open to him.

Further, as the foregoing applies with particular force to flying personnel who are predominantly officers, the medical officer must realize that in a limited sense, so long as he is in

the company of one or more of the pilots under his care, he is never entirely "off duty". He must study each pilot unostentatiously until he can detect the slightest departure from normal health, almost before the subject himself becomes aware of it. He must learn when to warn, when to comfort and when to ignore—indeed unless he has the necessary basis of tact and *savoir faire* he may well despair of complete achievement.

For this reason the young medical officer cannot hope to become fully efficient unless he lives in the mess. Here his advice may be sought as to the use of alcohol (*see* para. 583), and he will do well to remember not only that he is employed largely for his judgment and that with even moderate doses of alcohol the critical faculty begins to deteriorate but also that practice is better than precept.

The medical officer should seize every opportunity of learning to fly; for this he should consult his C.O., both as to the convenience of the occasion and the choice of pilot. Where the exigencies of the Service permit, he may have the opportunity to qualify as a pilot; this qualification will not only give him a first-hand knowledge of the nature of flight and the difficulties with which the pilot has to contend, but will also improve his standing in the minds of the pilots under his care.

The medical officer, in short, must study to become an officer of, and not merely in, the Royal Air Force, having special attributes enabling him not only to detect and arrest the onset of ill-health but also, by precept and example, to maintain the health of the entire unit to which he belongs.

On detecting a slight deterioration of efficiency or health in a pilot, the medical officer will first decide whether he is fit for the full duties of his particular category. Since only a medical board can permanently alter a category, the medical officer, faced with a condition of unfitness for the full duties of the category, has a choice between two courses:—

1. If he regards the deterioration as transient, he may confer with the C.O. as to the practicability of temporarily modifying the subject's duties, and may prescribe such measures as exercise, diet, etc., as he thinks desirable to promote the restoration of efficiency, or may recommend the grant of a short period of ordinary leave.

2. Where the condition is more serious than is likely to be corrected by such measures, he should recommend that the subject be suspended from some or all of his duties (according to their nature and the severity of the condition), and may apply for recategorization by a medical board.

SECTION II.—CARE OF FLYING PERSONNEL FROM THE
PSYCHOLOGICAL ASPECT

575. It should always be borne in mind that a pilot is liable to develop an "anxiety" in regard to his occupation, especially as the result of the stress of early training or of prolonged service in the air. As already pointed out, the first symptoms of such anxiety are best detected by a medical officer knowing each of his pilots personally. In dealing with such cases it is to be emphasized that no abstruse psychological methods are required, but common-sense. In gleaning information as to the anxiety state, note should be made of such points as change of habits, restlessness, irritability, tendency to jump at any sudden noise, or inability to concentrate. Enquiry should be made as to sleep and the nature of dreams or nightmares. The anxious pilot is particularly liable to insomnia, anxiety dreams, and nightmares. In his dream or nightmare he is nearly always performing something connected with his daily duties, and failing in its performance. The importance of good refreshing sleep cannot be over-estimated.

In connection with the "anxiety" state, the following remarks by the late Dr. W. H. R. Rivers, F.R.S., the eminent psychologist who was in charge of beds at the R.A.F. Central Hospital during the later stages of the war, are of particular value :—

"In the form of reaction to danger, which seems to be characteristic of the normal healthy man, there is a complete absence of the emotion of fear. No effort is needed to keep fear out of his mind, for it shows no tendency to appear in consciousness; and yet fear in the presence of danger is so necessary a part of the mental equipment of animals and is so frequently manifested in childhood, that we can confidently assume this emotion to be potentially present but in a state of suppression. This assumption is supported by several lines of evidence. A man who, when exposed to danger, experiences no traces of fear and behaves with the utmost coolness and bravery may yet suffer subsequently from acute fear in his dreams. If, as there is reason to believe, suppressed affective states find expression in dreams owing to the weakening of control normally exerted in the waking state, the occurrence of fear in dreams following a dangerous experience would be a natural consequence of its ordinary existence in a state of suppression."

"Still more important and conclusive is the occurrence of fear, as the result of shock or long-continued strain and fatigue, which lower the efficiency of the higher controlling levels of mental activity. Thus, one of the earliest signs of

the strain of warfare is the occurrence of apprehensions in one, who till then, has passed through the dangers of warfare without fear. The occurrence of fear, either manifestly or in the form of vague apprehensions when shock or strain has lowered efficiency, is naturally explained if the fear has been there throughout, but in so complete a state of suppression that it never passed the threshold of consciousness. As soon as fear or apprehension begin to show themselves in consciousness, a new process comes into action. The fear, no longer held unconsciously in check, has now to be consciously repressed. One who has flown or fought, perhaps for many months, without knowing fear, finds himself the subject of apprehensions which he regards with shame and strives to banish from his mind. A short rest at such a time, by allowing the unconscious controlling process again to take the upper hand, will often bring about the disappearance of the apprehensions so that danger can again be faced with equanimity and without the necessity for conscious repression; or the lowered efficiency of the controlling forces may be temporary, and the recuperative power of the sufferer may be so great that recovery of the normal state of suppression may come about, so that conscious repression again becomes unnecessary. More frequently, however, the conscious repression of fears or apprehensions only adds to the strain and fatigue which has led to the failure of suppression. Through the vicious circle thus set up there is produced a state of persistent anxiety in which even ordinary incidents of life, incidents wholly devoid of danger, come to be viewed with apprehension. The fears which are repressed with apparent success during the day find expression in an accentuated form at night, when the control exerted by day is removed in sleep or weakened in the state preceding or following sleep. The interference with rest so produced only serves to increase the state of strain and fatigue to which the nightmares or disturbing night-thoughts are primarily due, while disturbance of digestion or circulation due to the anxiety may react on and accentuate the state to which they are primarily due. Finally, some shock or additional strain, a slight accident which a few months before would only have raised a laugh, a misunderstanding with a superior officer or some domestic trouble, will bring about a crisis and reduce the sufferer to a state in which he becomes wholly unfit for any kind of duty. The morbid state which most frequently supervenes is that known as anxiety-neurosis, which is only an exaggeration of the morbid state of anxiety which precedes his definite breakdown. In other cases, the trouble may find expression in some mimetic disability usually known as hysteria;

while in those of psychopathic disposition there may be complete mental collapse, or the unbearable situation may be solved by the occurrence of these false rationalizations we call delusions."

"The special feature of practical importance in the foregoing statement of the various forms taken by the emotion of fear is that the occurrence of this emotion may be a symptom—often the earliest symptom—of a state of fatigue and strain. Owing to the way in which the society to which we belong, and especially those whose business it is to fight, look upon fear, its occurrence, especially without adequate cause, arouses other emotions, and especially that of shame, which greatly enhance the strain to which fear is primarily due."

"It is evident that the state so produced is one which gives ample scope for treatment, both preventive and curative. There is no department of medicine in which a medical officer can gain results so definite as in the treatment of the early stages of the anxiety-neurosis of warfare. The earlier he can act the better, for the longer the state of anxiety is allowed to last, the greater the conscious repression which becomes necessary, the longer is the period of rest which is required to enable the process of repression to become again effective. Moreover, the occurrences of disturbances of circulation or digestion, and of other organic functions, may produce complications which greatly prolong the process of recovery. Nowhere is the adage more appropriate that 'a stitch in time saves nine.'"

"A medical officer can only hope to succeed if he is on such terms with those under his care that they are ready to give him their full confidence, for owing to the general sentiment regarding fear, it is only with the greatest reluctance that its presence is acknowledged. It is here that the expression 'wind-up' has its peculiar utility in that it enables one in whom strain is producing apprehensions to refer, half seriously, half humorously, to his trouble. The first step in the treatment is to assure the patient that there is no cause for shame, that the fear he experiences is a well-recognized symptom of strain, and is due to the temporary failure of the mechanism by which, in the healthy and normal man, fear is kept under adequate control. If sleep is already disturbed by dreams, a second line of treatment will be to induce the sufferer to give up the process of voluntary repression to which, in the vast majority of cases, these dreams are due. Having by this process of education put the patient on the road to recovery, a short rest, followed perhaps by a period

of limited duty, will usually restore him to his normal level of efficiency. To send him for a holiday without the necessary process of education and reassurance is open to the serious risk that he will only continue, during the holiday, to repress or brood over his painful thoughts and feelings with the result that the state of anxiety is accentuated and becomes a fixed habit."

"Finally, it must be pointed out that *this line of treatment only holds good for those in whom the occurrence of fear is clearly the result of shock or strain. Those who are naturally apprehensive require a different line of treatment.* Their case is far more difficult and less hopeful than that in which fear is secondary to strain or shock, but much can be done with them by sympathetic encouragement in fighting their disability, and, when possible, by gradually introducing them to the conditions which rouse their apprehensions. There is reason to believe that in some cases such apprehensions are the definite sequel to some emotional shock in childhood or youth which has set up faulty trends in feeling and behaviour. In such cases a thorough and sympathetic discussion of the history of their fears may be of great service and may at least allow the medical officer to recognize how far the state is capable of amendment, and whether there is a reasonable hope that the patient may acquire that state of suppression of fear which in his more fortunate comrades has come into existence in childhood."

Experience has shown that the efficiency tests are of great value in connexion with the diagnosis of the "anxiety state", especially when this is due to stress. These tests afford indications as to the stability control of the circulatory and respiratory systems as well as of the general nervous stability, aiding also the assessment of the mentality of the subject.

SECTION III.—THE PHYSIOLOGICAL LIMITATIONS OF FLYING

576. Oxygen.—The human body is a heat engine, taking its heat from the oxidation of foodstuffs. The oxygen for this purpose is derived from atmospheric air, which contains some 21 per cent. of oxygen in a mixture believed to be otherwise physiologically inert, though this may be untrue of the one per cent. of argon and other rare gases which it contains; there is also present a minute amount of carbon dioxide, of the order of one part in three thousand, but this has little physiological significance.

This oxygen enters the body by means of the gas-exchange mechanism of the lungs, the oxygen diffusing with great rapidity through the capillary walls and into the haemoglobin



of the red cells, while the carbon dioxide, the end-product of combustion, which is carried in the plasma, leaves the blood by the same route.

Now gas does not move of itself ; some force is needed to make it do so, and this force is here derived from the difference in pressure between the oxygen in the alveolar air and that in the blood, whence, by analogy with Hooke's Law *ut tensio sic vis*, the greater the pressure difference the greater the diffusing force and hence the greater the rate of gas exchange.

From these considerations it will be apparent that the rate of intake of oxygen into the blood is a function, not of its percentage in the inspired air, but of its absolute pressure. Dalton stated that in a mixture of gases each ingredient exerts the same pressure as it would if it alone occupied the whole space, while Boyle's Law states that the pressure of a gas varies inversely as its volume. For the present purpose, both these laws are true, and this leads to the conclusion that in an atmosphere of ordinary air at "normal" pressure, the real or absolute or "partial" pressure of the oxygen is of the order of 21 per cent. of 762 mm. of mercury, or 160 mm. Hg. (but see later).

Consequently, since the composition of the air is almost constant at all heights attainable by man, and since the atmospheric pressure falls according to a rather complex formula as height increases (the rate of fall being greater near the ground), it follows that from the moment when a pilot leaves the ground, the force available for pushing oxygen into his blood begins to decrease.

There is naturally a limit to the amount of oxygen that the haemoglobin can take up, and this limit, or full saturation, is not quite reached in normal arterial blood, which is about 96 per cent. saturated. One reason for this is that in forcing oxygen into the blood the oxygen-pressure in the alveoli has fallen ; another reason is that the lungs are not fully emptied before inspiration, hence the incoming atmospheric air is diluted in the lungs with the residual oxygen-poor air.

The decrease in *vis a tergo*, or partial pressure, consequent on ascent, immediately produces a lowering in saturation of the blood with oxygen. This lowering is at first very small, producing a saturation of about 90 per cent. when the partial pressure is 60 mm. Hg. and the subject at rest, but falling very steeply thereafter. But here certain other factors come into force. The performance of external work (*i.e.* work other than that of the involuntary musculature) calls for the consumption of more oxygen, and, if the work is at all great, of vastly more oxygen. At ground level this is compensated for by the wide range of tolerable frequency of

breathing, which is capable of rising from its value at rest of about 15 per minute to something like eight times as fast, and which, in the trained athlete, is adequate for the maximum muscular output of which the body is capable. But whereas a healthy man can exist without untoward symptoms, resting, at a height of 19,000 ft. where the atmospheric pressure has half its value at ground level, the slightest exercise at that height causes a deficiency of oxygen in the blood and may make him pant, while with only moderate exercise he is liable to faint from anoxaemia.

But so far no account has been taken of the constant presence of moisture in the lungs. Dalton stated further that the pressure of a vapour (*i.e.*, of a gas below its critical temperature) which saturates a given space is constant for a given temperature, whether there is any gas also present or not, and that the pressure of a mixture of a gas and a vapour is equal to the sum of the pressures which each would exert if it alone occupied the space. The temperature of the lungs is constant at 37°C., at which temperature the vapour pressure of water is 47 mm. Hg. If it be assumed—and even if not academically correct the assumption is in fair agreement with observed facts—that on reaching the alveoli the inspired air has a temperature of 37°C., and is fully saturated with water vapour for that temperature, one must, in order to obtain the true value of the partial pressure of oxygen, first deduct 47 mm. from the atmospheric pressure and then take 21 per cent. of the difference.

From this it would appear that if a man could ascend to a height of about 63,000 feet, where the atmospheric pressure is 47 mm., he would be unable to inspire air (or any other gas) into his lungs, because the airspaces in the lungs would be permanently full of water vapour to the exclusion of all gases. That this is precisely what would happen is proved by the fact that "boiling point" is simply another name for the temperature at which the saturated vapour pressure of a liquid is equal to the atmospheric pressure—the water in the lungs would be boiling.

From this it will be seen that at a height of about 15,000 ft., where the atmospheric pressure is 430 mm. and the oxygen partial pressure in air inspired into the moist lungs just over 80 mm., there is just "enough" oxygen (though this word falsely implies quantity) in the air for existence under conditions of light physical effort, while at 18,000 ft., where the values are 380 and 70 mm. respectively, the oxygen pressure is just enough for existence at rest. If these limits are ignored, pilots are liable to suffer from the effects of oxygen want.



The obvious way out of the difficulty is to increase the partial pressure of oxygen in the inspired air for all flying at or above a height of 15,000 ft. This can most conveniently be done by increasing the percentage of oxygen in the air inspired, which is the principle followed in the R.A.F., and is applied by allowing a regulated stream of pure oxygen, whose rate of flow is calculated according to the height, to mix with the incoming air in a suitable mask. This method, however, is clearly limited as the percentage cannot be raised above 100, which is adequate for a height of about 40,000 ft. For flying above this height, therefore, some other way must be found of raising the partial pressure of oxygen.

Experience with the "40-mm. test" shows that the relative pressure in the lungs cannot be greatly raised without causing disturbances of the pulmonary circulation, hence it is impracticable to provide the necessary further increase of partial pressure of oxygen (which has now become simply the pressure of oxygen, since it is the only gas present in the inspire) by supercharging the lungs in the same way as an internal-combustion engine is supercharged in order to increase the amount of the explosive mixture in the cylinders. But if the supercharging is applied, not merely to the inside of the lungs, but to the whole body, the relative pressure in the lungs will remain normal and these disturbances will not arise. Consequently, for ultra-high flying, *i.e.*, at heights exceeding 40,000 ft., the pilot is enclosed within a pressure-tight, or "adiabatic", cabin or suit, in which the atmosphere is kept at a pressure slightly above that of the outer air. The latter, which somewhat resembles a diving-dress, is, for technical reasons of construction, the method of choice at present, but it has two main disadvantages—1. If the suit is torn, the contained pressure immediately begins to fall, and 2. the mere application of pressure within such a suit makes it relatively inflexible, so that movements of the limbs are somewhat impeded. These disadvantages, however, are not insuperable; the fabric used is exceedingly tough, and a relative pressure of only $2\frac{1}{2}$ pounds per sq. in. (130 mm. Hg.) is enough for any height, *i.e.*, for flying in a vacuum, and does not seriously embarrass the pilot's movements.

The following principles may be stated :

1. For flying at a height of 15,000 ft. or more, additional oxygen-pressure is *necessary* for safety ; no one should be permitted to indulge a mistaken courage by ignoring this limitation.

2. Given a proper supply of oxygen, there is not the least physiological risk in high flying (apart from cold, which is discussed below).

3. Oxygen is not a drug ; the oxygen supply apparatus does no more than supply a deficiency inherent in height. Since the blood is normally nearly saturated with oxygen, an excessive supply can do no harm ; it cannot " burn up " the tissues faster, as it does to a glowing splinter of wood. It has an irritant effect on the lungs in high concentration, but it can be breathed at the low pressures under discussion for at least many hours without the least observable ill effect.

4. The effects of oxygen want are not unlike those of alcoholism ; they lead first to an excessive and unjustified self-confidence, and later to a gradual *and most insidious* loss of consciousness, so that it is a commonplace for healthy and experienced pilots, experimentally on the point of fainting from lack of oxygen, to declare their complete confidence in their ability to pursue the experiment further.

5. Oxygen is useful also in maintaining the heat-exchange of the body at a physiological level under conditions of extreme cold, such as are encountered in winter at moderate heights and perennially at great heights.

Before leaving the subject of oxygen, a word of warning is necessary in connection with physical exercise while in flight. The method by which oxygen is usually supplied to pilots and other flying personnel consists of allowing a stream of oxygen at a known rate, calculated according to the principles already mentioned, to enter a small mask fixed over the mouth and nostrils and pierced by holes large enough to allow free passage of air in both directions. This results in a normal inspiration containing enough additional oxygen for the mixture to have an adequate partial pressure of oxygen, and if this mixture could be maintained regardless of the frequency of respiration, the subject would be able to exert as much physical effort as at ground level. But the rate of the oxygen-flow is constant for any given setting of the control valve (which is calibrated according to height, in five-thousand-foot intervals), consequently any increase in the frequency of respiration, which is in practice (though not necessarily) always accompanied by an increase in the rate at which the incoming air passes into the lungs, must result in the inspired mixture being poorer in oxygen. This at once establishes a vicious cycle, in which the panting makes the partial pressure of oxygen in the lungs less, thus causing further oxygen want and again an increase of panting, and so on. Flying personnel such as air gunners, therefore, whose duties require them to make appreciable physical effort, must first increase their oxygen-flow to a degree corresponding with a height

considerably greater than that at which they are, the amount of increase depending on the degree of effort. This can do them no conceivable harm, but as it is wasteful of oxygen they must reduce the flow to that which is normal for the height, as soon as circumstances permit. One very serious disadvantage of this method of oxygen administration lies in the fact that since the rate of flow is constant, oxygen must be pouring to waste throughout two thirds of the respiratory cycle, of which only the remaining third is occupied by inspiration. This difficulty, as well as that of the alteration of the mixture on increase in frequency of respiration, is overcome by the use of a lung-controlled apparatus. The slight negative pressure produced by inspiration is utilized to open a sensitive valve through which a fresh supply of oxygen is allowed to enter a bag, from which it is breathed by way of a closed mask.

577. Mechanical Forces.—(Note.—Certain mathematical terms, such as “force”, are here used in a sense more colloquial than mathematical.)

1. *Speed.*—There is no physiological speed limit. The truth of this statement is clearly seen on reflecting that everything on the surface of the earth is already travelling in a number of directions at different speeds, some of them completely beyond the range of any possible human attainment. For example, the surface of the earth is rotating about its axis at about 600 miles an hour, while the earth itself is travelling around the sun at 70,000 miles an hour, and so on. Movement, however rapid, does not affect the human body except when its speed or its direction changes, and, as we know from Newton's Laws of Motion, this cannot occur unless a force is applied to the body, which produces in the body a change of velocity (*see later*) inversely proportional to its mass. When a body, suspended in mid-air, is released, gravity causes its speed relative to the earth, which is initially zero, to increase at a fixed rate, or, to be more exact, would do so were it not for another force, the resistance of the air to passage through it, which opposes that motion.

2. *Acceleration.*—When an aircraft “takes off”, movement is imparted by the aircraft to the pilot by means of the application of a forward force to his back, with the result that he moves, with the aircraft, faster and faster until the speed reaches a steady value. All this time there is a force between the aircraft and the pilot pressing him forward, and there is clearly a limit to the extent of the force which a man can bear to be applied to any part of his body. Similarly, in slowing down, and especially in the rapid slowing down that occurs on landing, a force is applied in the contrary direction, and here he can stand even less, as the belt through which the greater

part of this force is conveyed covers a smaller area of his body (viewed along the line of application of the force), thus causing the pressure per unit of area to be greater for an equal total force. Further, given a constant speed, it requires force to change the direction of movement of the body, and here again there is a limit to what the body can stand.

In determining where these limits lie, however, the factor of time must be taken into account. A man who can stand a certain force for a tenth of a second may not be able to stand a smaller force acting for a longer time. There is yet the further factor of the point of application of the force, since the pressure of his own weight, which a man bears with ease on the soles of his feet, would be unendurable if applied to certain other parts of his body.

While it is impossible to sum up all these factors into one exact and comprehensive formula, something can yet be done to indicate the tolerable limits. Velocity is the name given to the compound of speed and direction; acceleration is the rate of change of velocity. Provided that the force is widely and evenly distributed, large accelerations can be borne by a fit subject without serious ill effect, and these are usually assessed in terms of gravity, which is an acceleration, or change of velocity, of some 22 miles an hour in every second for which it acts and is the rate of increase of speed when a man jumps from a height without a parachute (at least for the first second or two until the speed is such that air resistance begins to affect it appreciably); and it is this which causes the pressure on the soles of the feet or on the back, proportional to his mass and called his "weight", when a man is standing or lying supine.

The acceleration produced in a normal take-off is never of a very high order, being usually less than half that due to gravity (usually expressed as " $\frac{1}{2}g$ "), but in a catapulted take-off it may amount to $3g$, which means that during the process of catapulting, the forward pressure on the pilot's back is equal to what it would be if his seat were tilted over backwards on to the floor while two more men of his own weight sat on top of him (though this, of course, would cause a pressure on his front surfaces, which does not occur in a take-off), *i.e.* his horizontal weight or heaviness, which was previously zero, becomes three times his natural weight. The analogy of the two men sitting on him, though imperfect, yet demonstrates the importance of the provision of proper support for back and head so as to prevent violent jerking and to distribute the load over a relatively large area.

But acceleration occurs not only in the line of flight. When a stone is whirled around horizontally at the end of a string, it is constantly trying to fly away from the centre of rotation

(because force is needed to change velocity, of which direction in a straight line is a part, so that movement in a circle implies continual change of velocity), or, in other words, the stone has a horizontal weight which depends on its mass, its speed, and the radius of the circle of rotation. In gaining this new weight, however, it has lost none of its natural or gravitational weight, so that its total weight (that is, the total force that it exerts by virtue of its mass and movement) is now exerted, not vertically or horizontally, but in some new direction lying between these forming an angle with the vertical which depends on the ratio between the gravitational and horizontal weights. Hence, when an aircraft turns aside from straight-line flight, it and its contents, including the pilot, develop a new total weight which acts along this new direction, and the pilot must bank the aircraft until its "lift" is in the exactly-opposite direction, if he does not wish to sideslip. Now this new total weight must clearly be always greater than that due to gravity, since it consists of something added to gravity, and it is in this way that the greatest acceleration-strains on the human body are encountered in flight. In a fast aircraft turning very rapidly, the acceleration is of the order of $3g$ to $4g$, and similar accelerations occur when an aircraft is pulled out of a dive, though much greater values are sometimes encountered in both manœuvres.

When this happens, the weight of all parts of the human body is proportionately increased, and the blood, now being heavier, tends to be impeded in circulation, and requires more force to pump it anatomically upwards. It is also forced downwards with greater pressure than normal. In the lower limbs, where the blood vessels are supported by the tone of the skeletal musculature, this is less important than in the abdomen, where the splanchnic vessels, being relatively unsupported laterally, tend to dilate, so that the blood, whose volume has remained unaltered, leaves the upper end of the body and pools in the splanchnic area.

Such, at least, is the most generally accepted view; it would, however, be wrong to say that it is either positively true or unchallenged, for some observers maintain that the site of greatest pooling is the vessels of the thigh, and until this question is definitively settled it must be regarded as open, though it does not greatly affect the purpose of this manual.

If prolonged for more than a few seconds, this process overcomes the resistance of the abdominal muscles, and cerebral anaemia results with consequent fainting; but before this happens the retina (or possibly, according to some authorities, some other part of the visual apparatus) is deprived of some of its blood-supply and the well-known phenomenon of "blacking-out" occurs. From this it will be seen that the maintenance of

good tone in the muscles in general, and the abdominal muscles in particular, is of the highest importance to the service pilot, who is frequently called on to carry out aerobatic manoeuvres.

The converse phenomenon of "seeing red" is associated, *inter alia*, with acceleration in the opposite direction, as when doing an outside loop, in which the centre of rotation is not as in the ordinary loop above the pilot's head but beneath his feet, and consists of engorgement of the retinal vessels with blood, causing a reddish suffusion of the visual field. There is no physiological means of countering this.

The effect of acceleration on the human body depends not only on the degree of acceleration but also on the time during which it acts. Blood, like anything else, has mass and therefore inertia, hence the extent of deprivation of the brain, and other structures in the head, of blood depends on the degree of the acceleration and the duration of time. Beyond all this is the fact that the musculature can withstand such a force for a certain time but eventually gives way as the muscles tire. Thus a tame rabbit, whose abdominal muscles have not the tone of those of the wild rabbit, when suspended by the ears will eventually die in this way, although the acceleration is merely that due to gravity, while the same animal can survive a very brief exposure to an acceleration ten times as great.

3. *Rate of ascent or descent.*—When a pilot ascends, he passes into regions of progressively lower atmospheric pressure, whereupon the air or gas in any enclosed space in his body tries to expand. Such spaces exist actually in the intestine, as pockets of gas, and potentially in the middle ear and paranasal sinuses. If the rate of ascent is low the gas in the intestine is slowly absorbed or otherwise dissipated and no harm results, but if the ascent is rapid there is not enough time for this and dilatation of the intestine results with consequent pain (which may be very severe), faintness and even fainting; the obvious inference from this is that pilots and passengers should refrain from taking gas-forming foods before high flights. Similarly, if the nasal mucosa is so congested from a cold or some other cause, that the sinuses are blocked, pain may result, while a blocked eustachian tube will produce severe pain. On descending the converse process occurs. This does not affect the intestine, where passive contraction is painless, but where through obstruction of the eustachian tube air cannot re-enter the middle ear, the relative increase of atmospheric pressure causes the tympanic membrane to bulge inwards, which is intensely painful.

In normal flight the rate of ascent is seldom greater than 2,000 feet per minute near ground level (where atmospheric pressure changes relatively faster than height), and the only necessity is to avoid flying when the eustachian tubes cannot

readily be opened. But the rate of descent is in practice not infrequently as great as, and sometimes very much more than, the rate at which a man's body, without a parachute, would fall by itself, and here the necessity of patent eustachian tubes is even greater than in ascent.

In the following Table are set out the normal atmospheric pressures at intervals of 5,000 ft. up to 60,000 ft., from which it will be seen that a given rise or fall near ground level connotes a greater change of pressure than at considerable height. The pain caused by failure of the eustachian tubes to allow of equalisation of pressure on the two sides of the tympanic membrane is commensurate with the degree of bulging of the membrane, and, as this depends on the difference between the pressures within and without, the limit of rate of ascent or descent cannot be expressed without reference to the level about which the change of height is occurring. It will however suffice, as a rough generalization, to say that the rate of change of atmospheric pressure should not exceed one pound per square inch (or about 50 mm. Hg.) per minute, though for the reasons stated it would be imprudent to assume that a given lesser rate could always be regarded as safe.

Relation between Height and Atmospheric Pressure (I.C.A.N. Law; London Laboratory Conditions) :—

<i>Height.</i>		<i>Atmospheric Pressure.</i>		
<i>thousands</i>				
<i>of feet.</i>	<i>kilom.</i>	<i>mm. Hg.</i>	<i>ins. Hg.</i>	<i>lb./in.²</i>
0	0	762	29·99	14·74
5	1·52	634	24·96	12·26
10	3·05	524	20·63	10·14
15	4·57	430	16·93	8·32
20	6·10	350	13·78	6·77
25	7·62	283	11·13	5·47
30	9·15	226	8·91	4·37
35	10·67	179·4	7·06	3·47
40	12·20	141·0	5·55	2·73
45	13·72	111·0	4·37	2·15
50	15·24	87·1	3·43	1·68
55	16·76	68·6	2·70	1·33
60	18·30	53·9	2·12	1·04

Conversion factors :—

1 mm. Hg.	=	0·0394 in. Hg.	=	0·0193 lb./in. ²
1 in. Hg.	=	25·4 mm. Hg.	=	0·491 lb./in. ²
1 lb./in. ²	=	2·034 in. Hg.	=	51·7 mm. Hg.

4. *Caisson disease.*—Of the oxygen-content of the blood virtually the whole is carried by the haemoglobin, though there is also a minute amount in solution in the plasma. The blood is however exposed to a partial pressure of nitrogen nearly

four times as great as that of oxygen, and the amount of nitrogen held in solution in the blood is considerable. Hence it follows that when the atmospheric pressure is lowered, nitrogen is given off from the blood in much the same way as bubbles of carbon dioxide form in a soda-water syphon when some of the liquid is withdrawn and the pressure thus decreased. Provided that the decrease of pressure is not *both* too rapid *and* too great, the lungs are capable of releasing the surplus nitrogen as fast as it is given off, otherwise it is liberated in the form of bubbles in the tissues, causing the condition known as caisson disease, as in marine divers ascending too rapidly from a pressure of several atmospheres (33 ft. depth in salt water gives an additional pressure of one atmosphere). In the case of the pilot, however, the entire range of pressure cannot be more than one atmosphere, which is not enough to produce caisson disease.

CHAPTER VII

PREVENTIVE HYGIENE IN RELATION TO
AVIATION

580. Care of the Eyes.—Owing to the importance of good visual judgment in respect of flying efficiency, care should be taken to prevent, as far as possible, the development of any condition of the eyelids and conjunctivæ, which, if allowed to progress, may result in definite deterioration in the power of making accurate visual judgments. Pilots vary greatly in their power to resist the effects of dust, wind and glare. On this account, therefore, the medical advice in respect of the use of goggles when flying is always to wear them. In the tropics, the medical officer should always advise the use, on the ground, of anti-glare glasses with protective side-screens, more especially during the hot seasons. It should be remembered that it is of little service to wear protective goggles in the air under these conditions, if the true precautions on the ground are neglected. It is on the ground chiefly that discomfort and irritation, often leading to ocular fatigue, occur.

Further causes of the development of defective visual judgment are :—

1. Recent influenza and other debilitating diseases, *e.g.* sandfly fever ;
2. Accidents involving but slight concussion ;
3. Occupations of a technical nature and those which involve the use of one eye, *e.g.* use of micrometer screw gauges, slide-rules, microscopes ;
4. Prolonged fatigue, especially that associated with work and prolonged flights at high altitudes.

581. Care of the Ears, Nose, Throat and Teeth.—In flying, particularly in high flying, it is very important for the pilot to accommodate himself to the effects of diminished pressure upon the air enclosed within the tympanic cavities and the nasal sinuses ; any hindrance, for example, to efficient ventilation and drainage of the frontal sinuses, may lead to headaches of varying duration. As regards the tympanic membranes, the external auditory meatus affords a wide passage by which alterations of air pressure are easily transmitted ; the eustachian tubes, on the other hand, are narrow passages, which open only during the act of swallowing, and, do not so readily transmit pressure changes ; any catarrhal condition or congestion of these tubes, therefore, will tend to produce difficulty in the equalization of pressure on either

side of the tympanic membrane. The differences of pressure which may arise are not always appreciated. Generally speaking, during an ascent, the ears are subconsciously "cleared" by swallowing, which, under ordinary circumstances, is sufficient to open the eustachian tubes, and equalize the pressure on both sides of the membrane; occasionally, self-inflation, just sufficient to open the tubes, may be required to dispel the sensation of fulness; if, however, owing to eustachian obstruction, no equalization of pressure takes place, then, at 20,000 ft., the pressure in the external auditory meatus is approximately 380 mm Hg, while in the middle ear it is still 760 mm Hg, a difference of 380 mm Hg, the result being that the membrane is pushed outwards. If, on the other hand, equalization of pressure is made during a relatively slow ascent to 20,000 ft, but, owing to eustachian obstruction, little or no equalization is made during a subsequent rapid descent, then, on reaching ground level, there is a pressure of 760 mm Hg in the external meatus but only about 380 mm Hg in the tympanic cavity, with the result that the membrane is forced inwards, often painfully. Such an "invagination" of the membrane is sometimes found, immediately after landing, in pilots who complain of deafness, discomfort or pain in the ears, headaches, dizziness, nausea and, in certain cases, vomiting and fainting in the air. In less severe cases, inspection of the membranes often shows marked congestion. On enquiry, it will usually be found that the symptoms complained of have come on during descent or immediately after landing, and are, in most cases, attributable to difficulty in equalizing the pressure within and without the tympanic cavity on one or both sides of the head.

The importance, therefore, of adequate ventilation and drainage of the middle ear through the eustachian tubes, under rapidly varying degrees of atmospheric pressure, is manifest. Broadly speaking, any condition of the nose or throat, causing post-nasal catarrh or inflammation, is a potential factor in the causation of eustachian obstruction. The principal of these conditions are, deflected septum, the various forms of rhinitis, accessory sinus disease, unhealthy tonsils, adenoids, and infection of the nose or throat. Mouth breathing, as also excessive smoking and drinking, are predisposing causes. It must also be kept in mind that conditions of the nose, throat and ears of apparently trifling importance on the ground may become considerably aggravated in the air. Free nasal respiration and a healthy upper respiratory tract are essential to the pilot; if one of the above-mentioned conditions be present, producing signs or symptoms, it should be rectified.

Equality of pressure within and without the middle ear can often be maintained by the act of swallowing. Above

12,000 ft, however, the throat is apt to become parched owing to the necessity for breathing through the mouth as well as through the nose, and swallowing may become difficult. On this account there is much to recommend the use of chewing gum in the air, since this stimulates the flow of saliva necessary for the act of swallowing.

If a sudden descent be made, the pressure in most people is best equalized by inflating the ears; the nostrils are held tightly between the finger and thumb, the lips are closed, and air is forced out of the chest into the eustachian tube until good pressure is felt in both ears. Such inflation should be practised, generally speaking, once for every 1,000 ft. in drop.

It should be impressed upon flying personnel that medical advice is to be sought when there is any difficulty in equalizing the pressure in the ears, or when pressure can be equalized easily in one ear only, with consequent discomfort during flying.

The attention of medical officers is also directed to the fact that flying personnel may suffer from pyorrhoea. It has been found that this condition, like other chronic septic foci, accelerates the onset of flying stress and delays convalescence. The importance of keeping the teeth and gums in a sound and healthy condition should accordingly be impressed upon all flying personnel.

582. Clothing.—The air temperature falls about $3\frac{1}{2}^{\circ}$ F. per thousand feet of rise until the stratosphere is reached at about 36,000 ft., where the convection currents from the earth cease and the air temperature is constant at about -70° F. Hence all persons flying in open cockpits must be adequately clothed so as to avoid undue increase in heat-loss. Two mutually antagonistic effects—that of cold in increasing oxygen consumption, and that of height in causing relative lack of oxygen—make this all the more important.

The principle of clothing for warmth is to surround the body with a layer of still air; the thermal conductivity of the material of which clothing is made is of little importance in comparison with the amount of air enclosed within its meshes and the partition of this air into a very large number of pockets, thus impeding its free movement. Hence one is more warmly clad in several thin layers of loose-fitting and loosely-woven clothing than in an equal weight of the same material otherwise disposed. Air has a low specific heat (it does not take much heat to raise its temperature) consequently but little heat is lost in warming this layer of air, while its low thermal conductivity impedes further loss. The stillness of the insulating layer of air is ensured by enclosing the whole in an outer layer of wind-proof material.

This principle, however, must not be carried to excess. If there is no ventilation at all, the enclosed air becomes saturated with moisture and then the sweat can no longer evaporate; if this occurs in even a temperate climate the body temperature will rise from failure of heat-loss, and in a hot climate this will progress to heat-stroke.

The various articles of flying clothing issued to flying personnel in the R.A.F. have been designed with these principles in view, but unless they are properly cared for they will fail in their purpose. When great cold is expected—as in flying in winter in exposed positions or at any time of the year at great height—the clothes should be thoroughly warmed and dried before being put on. Drying is particularly important in the case of gloves and fleece-lined boots, and here it is well to remark that mere warming does not dry damp clothes—ventilation also is necessary. Warming merely increases the capacity of the air to take up moisture and unless this air is constantly removed and fresh, less-saturated air substituted, the absorbed moisture will condense as soon as the warming is discontinued. Failing any proper system of irrigating such blind alleys as boots and gloves with warm and relatively dry air, they should be turned inside out, as far as possible, and placed in a well-ventilated drying-room, and not in a cupboard or locker.

The modern flying helmet is a great improvement on its predecessors and it is worth a considerable expenditure of trouble to ensure that it is a perfect fit and thus able to give the protection that it should. Especially is this important at the front edge of the cheek-pieces where a slack fit will allow the wind of the slip-stream to enter and even to interfere with hearing.

No article of flying clothing should be worn for longer than is necessary, as while in use it is continuously absorbing moisture and so becoming less effective as a thermal insulator. The pilot who values his comfort and efficiency will not only remove his flying clothing immediately after a flight but will forwith put it in circumstances favourable for drying.

When through frequent use and washing woollen garments, especially socks, have become tight they should be discarded as they will do more harm by restricting circulation than good by insulation.

583. Tobacco and Alcohol.—It is fairly generally agreed that moderate and timely indulgence in these by fit men is not harmful, but this statement is rendered almost dangerous by the fact that few people, no matter how intemperate, can be brought to admit that their usage surpasses the bounds of moderation.

The amount of pyridine absorbed by a heavy smoker can hardly fail to have some action on the heart, while the carbon monoxide entering the blood of those who inhale from cigarettes produces an effect which, though transient, is no less marked while it lasts.

The principal virtue of alcohol is that it is not a stimulant but a depressant, banishing the feeling of fatigue, but this is also its principal danger, for it has no effect on fatigue itself, except to increase it. Alcohol should never be taken until the work of the day is done, and even if taken then the spurious sense of refreshment that it confers must not be allowed to instil the belief that the subject is capable of further prolonged effort with impunity. Only one thing can remove fatigue—rest—and the most perfect form of rest is sleep.

CHAPTER VIII

HYGIENE AND PATHOLOGY

SECTION I.—INSPECTION OF A R.A.F. STATION.

600. Sanitation Inspection.—1. The medical officer will inspect the whole of the station, including the married quarters, at least once a week, and will keep a sanitary diary (S.O. Book 127 is suitable for this purpose) in which he will record all defects discovered. He will arrange with the C.O. for a representative to accompany him on his inspection. After each inspection he will pass the book to the C.O. of the station for his action, comment and signature: for this purpose the right-hand page will be left blank. He will produce his sanitary diary at all inspections by higher authorities. (See K.R. & A.C.I., para. 1485.) Schools will be inspected at times when the children are present, in order to ascertain whether their studies are pursued under hygienic conditions. The medical officer will note in his sanitary diary any conditions likely to affect the health of the children, and make such representations as circumstances demand. Service mineral water factories will be inspected as laid down in A.P. 1269A. to ensure hygienic manufacture of mineral waters.

2. At marching-in inspections and inspections by the competent medical authority and senior works officer, the unit medical officer will be present. (See K.R. & A.C.I., paras. 1849, 1850 and 1852.) The medical officer may be detailed to attend any board on appropriation of sites, etc., and at times will be called upon to advise the C.O. on the sanitary requirements of new proposals. (See K.R. & A.C.I., paras. 1835, and 1837.)

601. Medical Examinations and Inspections.—1. *Airmen.*—Whenever special examinations of airmen are made, each man will be examined by the medical officer in private, and in the presence of a third person, who should, where possible, be an N.C.O.

2. *Children.*—Children attending air force schools will be medically examined periodically by the medical officer of the station. These examinations will be undertaken in such a way as to interfere as little as possible with school work, and on the following occasions:—

(a) At the time of, or shortly after, their first admission to school.

(b) At the third year of school life.

(c) At the sixth year of school life.

(d) Immediately before finally leaving school.

In all cases where physical defects or the presence of disease is observed, the parents should be recommended to adopt suitable treatment, particularly as regards defects of vision, when the timely use of corrective glasses may save the eyesight from permanent injury. The presence of one or other of the parents is desirable at the examination of younger children.

In overseas commands, all school children will be examined annually and a record of each examination will be made in a book kept for such a purpose. (*See para. 321.*)

602. Space Allowance in Barracks.—The M.O. will satisfy himself that the authorised cubic space for each man (*see K.R. & A.C.I., para. 1844*) in barracks and guardrooms is actually provided, and that beds are spaced as far away from each other as possible. In order to lessen the spread of droplet infections in barrack-rooms, the heads of alternate beds in each row can be placed in opposite directions. This procedure is specially necessary in temporary hutted barracks where it may be unavoidably necessary to reduce the floor space from 60 to 45 square feet per man.

603. Ventilation, Lighting, Limewashing.—The M.O. will satisfy himself that every barrack, guardroom, and detention room is suitably lighted and provided with sufficient means of ventilation; that the beds and bedding are freely exposed to the air; that the married airmen's quarters, institutes, kitchens, washhouses, workshops, lavatories, urinals and latrines are suitably ventilated and lighted; and that the walls and ceilings of barracks or quarters are clean and in a satisfactory condition. He will ensure that the instructions contained in K.R. & A.C.I., paras. 1485 and 1765, are observed. Reference to the temperature to be maintained in detention rooms will be found in K.R. & A.C.I., para. 1215, clauses 4 and 5.

604. Arrangements for cleansing Drinking Utensils.—He will frequently inspect the method of cleaning of drinking vessels in the station institutes and canteens, and satisfy himself that all cups, mugs, tumblers and cutlery are washed after use by each person in accordance with K.R. & A.C.I., para. 1778, clause 2.

605. Food Supplies.—1. He will supervise the food and messing arrangements of the station, paying particular attention that the diet is well balanced and varied, the cooking is good, the kitchen and its personnel clean, and that all food is adequately protected from flies and dust, as laid down in K.R. & A.C.I., paras. 1486 and 1765A. If he considers that any foodstuff is unfit for human consumption he will give the C.O. a certificate to that effect, stating whether the food is fit

for other than human consumption or not, and, if applicable, a copy to the institute manager in accordance with K.R. & A.C.I., para. 1776. Should a board of officers be convened he will be a member. (See K.R. & A.C.I., para. 2677.)

2. Air Publication 112 should be consulted as regards the supply and protection of foodstuffs, ration scales and messing arrangements. Specimens of food and drink will be despatched for analysis as detailed in para. 728.

3. In overseas commands it is most important for the prevention of disease that the food of service personnel and their families should be procured only from approved sources. For this reason it is desirable that foodstuffs, particularly meat and vegetables, should be obtained as far as possible from Service ration stores.

606. Dope Workers and Dope Shops.—1. In connexion with the medical inspection of dope workers and of dope shops, medical officers should note K.R. & A.C.I., paras. 1481, clause 2 (d), 1485, clauses 5 and 6, and 2660.

2. The usual symptoms attributable to the use of dope are headache, drowsiness, dryness of the throat, cough, sense of constriction of the chest, nausea, vomiting, intermittent pulse and progressive loss of weight.

3. The prevention of these symptoms depends on :—

(a) *Efficiency of Ventilation.*—The air of a room used for doping should be changed thirty times each hour, while the temperature has to be maintained at 68° to 70° F. Mechanical ventilation is necessary, with the extracting fans at or near the floor level on one side and the air inlets about 10 ft. above that level at the opposite side of the room, and with a total area of not less than three times the total area of the extract openings. Slowing the extract fans or blocking the air inlets must not be permitted. Heating should be effected by means of hot water or steam pipes and radiators fixed close to the air inlets. To lessen the danger from fumes personnel should work back from the fan towards the air-inlet while applying dope. Form 122 should be conspicuously displayed. The efficiency of the ventilation may be tested by means of a smoke bomb.

(b) *Alternation of Work.*—If possible, airmen should not be employed continuously on doping but should be transferred periodically to other work, outdoor for preference. A sufficient break in the morning, to allow of light refreshment (milk or cocoa), is advisable from a prophylactic point of view. (See K.R. & A.C.I., para. 2660.)

(c) *Periodic Physical Inspections.*—At the routine quarterly inspection of dope workers (K.R. & A.C.I., para. 1481, clause 2 (d)) the medical officer will carefully note any change in any worker's physical condition, and, if such should be observed, he will take steps to remove the worker from dope work or keep him under observation.

607. The Unit Sanitary Detachment.—This detachment, which should consist, as far as possible, of airmen trained in camp sanitation and hygiene, has its duties allotted by the C.O., in consultation with the medical officer, and is responsible for executive duties in connexion with conservancy in barracks, camps and billets, and for acting as sanitary police. (See A.P. 1269A. and K.R. & A.C.I., paras. 1485 and 1846.) Overseas, natives form the major part of the Sanitary Squad.

608. Water Closets—Removal of Scale.—1. Where ordinary cleanliness fails to keep W.C. pans free from scale, the water should be removed from the pan by means of a dipper or by driving it down the drain by a closet brush. The scale should then be coated with hydrochloric acid (spirits of salt) on a rag twisted round the end of a wooden stick. The process is repeated until the scale disappears, then the pan should be flushed out immediately several times with water.

2. Hydrochloric acid is a corrosive, and should be washed off the skin immediately after any accidental contamination. Sulphuric acid (oil of vitriol) is a very dangerous corrosive and its use for removal of scale is prohibited.

SECTION II.—CONTROL OF COMMUNICABLE DISEASES.

A.—*General Instructions.*

B.—*Vaccination against Small-pox.*

C.—*Inoculation.*

D.—*Disinfection and Disinfestation.*

E.—*Measures to be adopted in certain Diseases.*

A.—*General Instructions.*

615. Initiation and Enforcement of Preventive Measures.—In this connexion medical officers should be conversant with K.R. & A.C.I., paras. 54, 58, 1399, clause 7, and 1418. They should maintain touch with the civil public health authorities of their districts and arrange with them for the mutual exchange of information as to the occurrence of communicable diseases in their respective spheres. C.Os. are responsible for the enforcement of all measures designed to prevent the occurrence of disease on their stations. (See K.R. & A.C.I., para. 54 and 58.)

616. Notification of Cases of Communicable Disease.—The notification of infectious disease will be carried out as laid down in K.R. & A.C.I., paras. 1418, 1461, 1471 and 1799, clause 8. Form 418 should not be completed for suspect cases until the diagnosis is confirmed, but precautionary measures should be taken and the C.O. informed.

617. Diseases to be notified.—1. *Notifiable by Law to the Civil Authority* :—

Anthrax (b).	Pemphigus neonatorum (b).
Cerebro-spinal fever (a).	Plague (a).
Chicken-pox (b).	Pneumonia (a)
Cholera (a).	(i) Acute influenzal.
Continued fever (a).	(ii) Acute primary.
Diphtheria (Membranous Croup) (a).	Polio-encephalitis (a).
Dysentery (protozoal and bacterial) (a).	Polio-myelitis (a).
Encephalitis lethargica (a).	Puerperal pyrexia (a).
*Enteric fever (a).	Puerperal septicaemia and pyaemia (a).
(i) Typhoid fever.	Rabies or hydrophobia (b).
(ii) Paratyphoid fever.	Relapsing fever (a).
†(iii) Enteric group (clinical).	Scarlet fever (a).
Erysipelas (a).	Small-pox (a).
Glanders (b).	Tuberculosis (all forms) (a).
Malaria (state type and whether primary case or relapse, and where contracted) (a).	Typhus (a).
Measles (a).	Whooping Cough (a).
Ophthalmia neonatorum (a).	Yellow fever (b).
	and any other disease which the Sanitary Authority may add with the approval of the Minister of Health.

2. *Additional Diseases Notifiable in the Royal Air Force* :—

Beri-beri.	Jaundice.
Bilharziasis (Schistosomiasis).	Leishmaniasis.
Blackwater fever.	(i) Kala-azar.
Enteritis (infective).	(ii) Oriental sore.
Food poisoning (due to any cause).	Tetanus.
	Trench fever.
	Undulant fever.

N.B.—Additional diseases may be added to those noted at (a) and (b) by the Civil Sanitary Authority with the approval of the Minister of Health.

* For Army personnel A.F. I 3056 will also be rendered.

† Diagnosed on clinical evidence only.

(a) Notifiable by law to the Civil Authority.

(b) Notifiable, only in certain districts, by law to the Civil Authority.

3. *Special Reports* will be rendered by the competent medical authority in the event of an outbreak of communicable disease of unusual extent either among R.A.F. personnel or the civil population of any unit, camp or neighbourhood, for the information of the Air Ministry. A report on the occurrence of a case of any dangerous communicable disease should also be made. (See para. 623, and K.R. & A.C.I., para. 1461.)

618. Definitions of Special Terms.—1. *Contact*.—Contacts are those who have closely associated with a person infected with a communicable disease, *e.g.*, those who sleep in adjacent beds, those who occupy the same tent, and close friends of the infected person. Medical officers are required to use their discretion in dealing with other possible contacts, having regard to the nature of the disease and the length of exposure to infection.

2. *Carrier*.—A carrier is a person who harbours and excretes pathogenic organisms without showing the usual evidences of the disease produced by the organism in question. Carriers may be classified as follows :—

(a) *True Carriers*, who, according to the nature of the disease, harbour in the naso-pharynx, alimentary tract, urine, blood or skin, organisms which are pathogenic and virulent ; they may be subdivided into

(i) Incubatory carriers.

(ii) Convalescent carriers (temporary or chronic).

(iii) Contact carriers (temporary or chronic).

(b) *Pseudo Carriers*, who harbour organisms indistinguishable, except by strict tests, from pathogenic and virulent organisms. Pending complete investigation, these must be regarded as true carriers.

3. *Suspects*.—A suspect is a person showing signs or symptoms which, though not definitely diagnostic in character, may indicate some stage of a communicable disease.

4. *Quarantine*.—Quarantine is the application of such restrictive measures to the activities of contacts, carriers, suspects and cases of communicable disease, as may be reasonably expected to prevent the further spread of the disease.

(a) *Working Quarantine* is segregation in such a manner, that those so segregated are not brought into contact with other persons, yet their performance of certain duties, such as fatigues, drill, and instruction, is not interrupted.

(b) *Absolute Quarantine* is the detention of all contacts and suspects in complete isolation, either individually or collectively, as circumstances may warrant.

619. Establishment of Quarantine Measures.—1. At a unit these will be made by the C.O., when necessary, on the recommendation of the medical officer. (See K.R. & A.C.I., para. 1418, clause 4.)

2. Direct contacts should be held in working quarantine and be medically inspected at least once daily, in order that early cases and suspects may be detected.

3. Absolute quarantine of large bodies of men should be instituted only when a disease of a serious nature exists or threatens to become widely disseminated.

4. In certain communicable diseases all quarantine measures may be dispensed with, reliance being placed upon careful medical inspection conducted at intervals to ensure detection of cases in their early stages.

5. The medical officer will notify the C.O. when men quarantined can be released.

6. In case of doubt, absolute quarantine should be applied in accordance with K.R. & A.C.I., para. 1418, until the competent medical authority (and where the civil population is involved, the local Medical Officer of Health) has been consulted.

620. Quarantine of Dogs.—See para. 701, clauses 3 and 4 and K.R. & A.C.I., para. 876.

621. Isolation of Cases.—1. Medical officers will ensure that all cases of communicable disease are removed from contact with other individuals at the earliest possible moment.

2. Wherever proper accommodation exists, isolation will be effected in hospital; but where this is impracticable, as frequently happens in the case of officers and their families and among the families of airmen, in certain diseases, isolation will be carried out in quarters as far as possible. (See K.R. & A.C.I., paras. 1515, 1522, 1533, 1534, 1535 and 1545.)

3. When considered necessary, in the event of an epidemic, cases may be isolated and treated in a suitable quarter on the station, chosen temporarily for this purpose.

4. Cases under observation may be accommodated in the observation ward of station sick quarters. (See K.R. & A.C.I., para. 1585, clause 3 (b).)

622. Communicable Disease and Attendance at Schools.—

1. All children suffering from any infectious disease should be excluded from school until free from infection, and until adequate disinfection of the house and child's clothing and effects has been carried out.

2. Special care should be taken to prevent children of an infected family attending school, or mixing with other children at home or play, until the medical officer certifies that they can do so without risk of spreading infection.

3. The usual periods of exclusion of children from school for patients and contacts is as follows :—

Disease.	Period of Exclusion.	
	Patients.	Contacts.
Chicken-pox ..	Three weeks, or until all scabs have disappeared.	Infants, and other children who have not had the disease, three weeks from date of last exposure to infection.
Diphtheria ..	Two to three weeks after end of attack ; or until pronounced free from infection by a medical practitioner.	Two weeks after removal of patient to hospital, or, in the case of patients treated at home, ten days after release from isolation. Negative swabs should be obtained.
German measles ..	One week from date of appearance of rash.	Infants, and other children who have not had the disease, three weeks from date of last exposure to patient with rash.
Measles	Three weeks from date of appearance of rash.	Infants, and other children who have not had the disease, three weeks from date of onset of last case in house.
Mumps	Until one week after subsidence of swelling.	No exclusion.
Scarlet fever ..	Two weeks after return from hospital, or, in the case of patients treated at home, two weeks after release from isolation.	One week after removal of patient to hospital, or, in the case of patients at home, one week after release from isolation.
Small-pox ..	Six weeks, or until the patient is certified free from infection by a medical practitioner.	Sixteen days, unless recently vaccinated, when exclusion is unnecessary.
Whooping cough ..	Six weeks from commencement of cough.	Infants only, for six weeks from date of onset of last case, or three weeks from date of last exposure to infection

4. R.A.F. schools will not, as a rule, be closed in consequence of the occurrence of communicable disease, but should the outbreak assume an epidemic form or should the medical officer, for any special reason, deem it necessary that the school should be closed, he will inform the competent medical authority who, if he sees fit, will advise the air or other officer commanding to order the closure.

5. All School Closure Notices should specify a definite time during which the school will remain closed ; this should be as short a period as can be regarded to suffice on public health grounds, since a second notice may be given before the expiry of the first, if it should be found necessary to postpone the re-opening.

6. Much can be done to prevent the spread of infections in schools by attention to the ventilation and sanitation of schoolrooms and cloakrooms, by stopping the practices of spitting on slates and the exchange of penholders and pencils, by the frequent washing of floors, and by not allowing children to sit in school in wet clothes or with damp feet. Protective inoculation against diphtheria and scarlet fever, and vaccination against small-pox should be practised as widely as possible with the parents' consent.

7. When outbreaks of infectious disease occur in schools, special search should be made for unrecognized " carriers ".

623. Investigation of Outbreaks.—1. The main inquiry should be directed to the known routes of infection for the particular disease concerned. The possibility of cases having been missed, either through errors in diagnosis or through failure of the patient to report sick, should be borne in mind. Early information should be obtained as to the movements of the first patients during the three weeks immediately preceding the onset of their illness. The subsequent series of cases and their connexion with the first cases or with a common cause should be carefully traced, recorded in detail and plotted out on a spot map. Unless there is distinct evidence of another source of infection, attention should be directed to any sanitary defects in the station, camp or their surroundings. Investigation should be made regarding food, water, milk and other supplies, both official and private ; the methods of disposal of refuse and excreta ; the existence of breeding places of flies and other disease vectors, and their presence in excessive numbers.

2. In reporting on the outbreak, reference should be made to methods adopted for the isolation of the sick, segregation and observation of contacts and carriers, disinfection, and general sanitary measures which have been taken.

624. Incubation and Segregation Periods of Notifiable Diseases.

Disease.	Incubation period in days.		Segregation period for contacts.
	Usual.	Limits.	
<i>Droplet Infections.</i>			
Cerebro-spinal fever	2-3	1-10	Nil. Space out, especially beds.
Chicken-pox ..	12-14	12-21	Nil, except 21 days for children.
Diphtheria	2-3	2-10	Nil if prophylactic inoculation done, otherwise 10 days.
Influenza	2-3	1-4	Nil.
Measles	14	7-14	Nil. Contacts examined daily between 7th and 14th days.
Mumps	18-21	12-26	Nil. Contacts examined daily for a month.
Rubella	15-18	9-21	Nil. Contacts examined daily between 7th and 21st days.
Scarlet fever ..	2-3	1-8	Nil if prophylactic inoculation done, otherwise 10 days.
Small-pox	12	10-14	Successful vaccination or 16 days.
Whooping-cough ..	7-14	2-18	Nil, except 21 days for non-immune children.
<i>Food and Water Borne.</i>			
Cholera	1-3	1-5	6 days.
Dysentery (bacillary)	1-3	1-5	Nil. Contacts observed daily for a week.
Enteric fever ..	10-14	8-21	Nil. Contacts observed daily for 21 days.
Paratyphoid fever .	10-14	8-21	Nil. Contacts observed daily for 21 days.
Undulant fever ..	10-14	8-21	Nil. Contacts observed daily for 21 days.
<i>Insect Borne.</i>			
Plague	3-5	1-6	6 days after disinfestation.
Relapsing fever ..	8-10	2-14	10 days after disinfestation.
Trench fever ..	5-12	5-21	Disinfest and observe for 14 days.
Typhus fever ..	5-8	5-12	14 days after disinfestation.
Yellow fever ..	3-4	2-6	6 days (use mosquito net).
<i>Direct Inoculation.</i>			
Anthrax	1-3	1-3	Nil.
Rabies	42	7-170	Nil.
Tetanus	8-12	3-200	Nil.

Cases of the above diseases will be isolated, in hospital where possible, and kept under treatment in isolation until the accepted criteria of cure are established.

Measures adopted at sea and airports against plague, cholera, yellow fever, typhus and small-pox will be as defined in the International Sanitary Convention of Paris, 1926, and the International Sanitary Convention for Aerial Navigation of the Hague, 1933 (*see* A.P. 1269A).

B.—Vaccination against Small-pox

630. 1. The duties of medical officers in regard to vaccination are laid down in K.R. & A.C.I., paras. 1416 and 1489.

2. An officer or member of the nursing service should be vaccinated against small-pox just prior to joining the Service, otherwise as soon as possible after joining.

3. A cadet should be vaccinated as soon as possible after being passed fit by the Central Medical Board, unless he has been successfully vaccinated within the last five years.

4. A recruit should be vaccinated as soon as possible after joining the Service.

5. Apprentices and boy entrants need not be vaccinated before joining the Service. They will not normally be vaccinated during boy service unless that is necessary on account of local occurrence of small-pox. Vaccination will be performed when their period of regular engagement commences.

6. When an officer, member of the nursing service or airman refuses to be vaccinated the word "refused" will be entered in red ink in the appropriate column of Form 48, and the entry dated and signed by the person concerned (*see* para. 259 (3) (e).)

7. The vaccination state of all air force personnel and their families on a station will be reviewed yearly in October, and steps taken to recommend and carry out re-vaccination where necessary (*see* para. 636, also K.R. & A.C.I., para. 1416, clause 9).

631. Re-vaccination of officers, members of the nursing service and airmen will be carried out every five years during the first fifteen years of service, unless special circumstances (*see* para. 634) require it to be done at an earlier date. Particulars of vaccination will be noted on Form 48 and on Form 64 (when issued). Only those cases in which either vesicles, normal or modified, or papules surrounded by areolæ have resulted will be recorded as "successful."

632. Families of R.A.F. Personnel.—1. Medical officers who perform the vaccination of infants, required by law, will complete the blank certificate of vaccination given to the parents at registration of birth, and instruct them to send it to the Vaccination Officer, whose address will be found on the certificate.

2. Families, before embarkation for abroad, are required to obtain a certificate of vaccination in accordance with K.R. & A.C.I., para. 937, clause 2 (c).

633. Failure of Vaccination.—1. When vaccination is unsuccessful, two further operations should be carried out at intervals of one month. The procedure should also be followed when re-vaccination fails, unless the previous successful vaccination was within five years.

2. The number of apparent failures to re-vaccinate suggests that there may be some misconception as to the true nature of a normal positive response to re-vaccination. This is divisible into three groups: (a) those which closely simulate primary vaccinations and imply the disappearance of immunity previously acquired; (b) those which show a definite reaction accelerated by a few days; and (c) those which run a very short, mild and rapid course, with a period of incubation of one day, producing only a minute vesicle which disappears completely within a few days.

634. Re-vaccination in Epidemics.—When an epidemic of small-pox occurs, vaccination will be recommended in all cases in which there is no satisfactory evidence that it has been done within two years.

635. Source of Calf Lymph (*see* para. 369).—1. Medical officers must ensure that all unused stocks of calf lymph are returned, and that reports on the results of all used tubes are rendered to the Government Lymph Establishment (or other source of supply) in accordance with their requests. It is important that quantities of lymph in excess of that likely to be used in any one week should be not indented for.

2. For stations abroad, supplies of lymph will be sent out in cold storage at regular intervals or on demand, unless other local arrangements have been made.

636. Instructions to Vaccinators.—1. Except so far as any immediate danger of small-pox may require, the medical officer should vaccinate only subjects who are in good health. As regards infants, he should ascertain that there is no febrile state, irritation of the bowels, unhealthy state of the skin, and especially no chafing or eczema behind the ears, in the groin, or elsewhere in folds of skin. He should not, except of necessity, vaccinate where there has been exposure to the infection of diseases such as measles, scarlet fever or diphtheria, nor where erysipelas is prevailing. Moreover, except in the presence of an outbreak of small-pox, or before a family proceeds abroad, the medical officer should not press for primary vaccination of children of school age, owing to increased risk of complications occurring in such cases.

2. The lymph for vaccination must be used within one week of its receipt ; in the interval it should be kept in a cool place.

3. The medical officer will keep such record of the lymph that he has used as will enable him at any time to identify the lymph used for any particular vaccination.

4. The vaccination should be performed with an instrument of such a character, and in such a way, as will obviate the drawing of blood ; a lancet with a metal handle or a needle should be used. *The handle of the instrument should not be used for rubbing in the lymph.*

5. The instrument should be sterilized by first dipping it into methylated spirit, and afterwards passing it through a flame.

6. The medical officer must keep in good condition the lancets or other instruments which he uses. When he vaccinates, he should cleanse and sterilize his instrument after one operation before proceeding to another. When once he has unsealed the tube of lymph, he should never attempt to keep any part of its contents for the purposes of vaccination on a future occasion, but one tube is sufficient to vaccinate 2 to 3 individuals at one time. The tube should be broken with sterilized forceps. In no circumstances should the mouth be applied directly to expel the lymph by blowing ; an artificial expeller should be used for this purpose.

7. Vaccination should at every stage be carried out with aseptic precautions. These should include first the cleansing of the skin before vaccination ; secondly, the use of sterilized instruments ; and, thirdly, the protection of the vaccinated surfaces against extraneous infection at any time.

8. The site for vaccination is usually on the upper arm, not lower than the insertion of the deltoid muscle. Females may desire to be vaccinated on the external aspect of the thigh, immediately above the knee.

9. The cleansing of the skin should be carried out by washing with soap and water or with spirit, which must be dried off before vaccinating.

10. In all ordinary cases of vaccination or re-vaccination, the operation should be done by means of a single vertical linear scratch, one quarter of an inch long, merely through the epidermis, and in the long axis of the limb. The lymph may be applied to the cleansed skin and the scratch made through it, or the lymph may be applied after the scratch has been made. Only gentle rubbing with the side of the needle or lancet blade should be employed in applying the lymph. The aim of the vaccinator should be to produce successful vaccination with the minimum of injury to the tissues.

11. This method of vaccination is considered to give a reasonable degree of protection against small-pox, but if any adult desires to obtain at once the greatest possible immunity, then, at his request, the medical officer may increase the number of vertical incisions to a maximum of four, each one quarter of an inch long, and approximately one inch apart.

12. When the lymph has dried, a protective covering should be so applied as to avoid constricting the vaccinated surface. Boric lint, two and half inches square, forms a suitable protective dressing; this is kept in position by strips of adhesive zinc oxide plaster which must not completely encircle the limb. A bandage should not be used for the purpose.

13. The vaccinated person should be instructed to report immediately if the protective dressing slips and exposes the vaccinated surface.

14. Vaccinated persons should be dealt with as out-patients, and, if necessary, seen daily; this is particularly important from the 5th to the 10th day, during which period a sling for the arm may be required. *All cases should be inspected on the 5th day*, otherwise a mild reaction may be missed.

15. *If the protective dressing adheres to any part of the vaccinated surface, it must be removed with the utmost care, using boiled water for this purpose. The arm should be redressed at intervals as required until the vaccinated area has healed.*

C.—Inoculation

640. Inoculation.—The duties of medical officers in regard to inoculations are laid down in K.R. & A.C.I., para. 1416. The commoner protective inoculations given in the Service are against typhoid and paratyphoid fevers (para. 643), diphtheria (para. 644), scarlet fever (para. 645), cholera (para. 646) and plague (para. 647).

641. Issue of Vaccines (*see* para. 369).—1. In order to minimize waste, the vaccine is sent out in rubber-capped bottles holding 25 c.c. or 50 c.c., and in ampoules holding 1 c.c., 0.5 c.c. and 0.25 c.c.

2. In view of the labour involved in the preparation and standardization of the vaccine, every endeavour should be made to economize it as far as possible.

3. Each bottle is labelled with the following particulars:—

- (a) Nature of vaccine.
- (b) Serial number.
- (c) Dose.
- (d) Directions.
- (e) Date before which the vaccine should be used.

642. Method of Inoculation.—1. Care and use of the syringe.—

A small graduated syringe of 1 to 5 c.c. is most suitable for the injection of vaccines. The syringe and needles should be sterilized by boiling in the usual way, and allowed to cool prior to filling with the vaccine.

To fill the syringe from (a) rubber-capped bottles, or (b) small ampoules :—

(a) Shake the bottle. Sterilize the rubber cap with tincture of iodine or spirit. Invert the bottle and puncture the rubber cap with the needle through the sterilized area. Then slowly fill the syringe, taking care to keep the point of the needle immersed in the vaccine. Needles are blunted by puncturing the rubber cap, therefore use an old sterile needle for this purpose and leave it in position in the cap for refilling. Connect the syringe with a sharp sterile needle for the inoculation.

(b) Shake the ampoule. A file mark should be made on the neck of the ampoule, which should then be sterilized in the flame and broken off with sterile forceps; the ampoule is inverted, the sterile needle introduced and the syringe filled.

A fresh sterile needle is required for each inoculation, but it is unnecessary to boil the syringe between each injection.

2. Injecting the vaccine.—The site for inoculation with T.A.B. vaccine is the outer side of the arm at the level of the insertion of the deltoid muscle.

The skin should be cleansed previously with antiseptic lotion, alcohol and ether, or by painting the site of inoculation with tincture of iodine which should be allowed to dry before the inoculation is given.

643. Typhoid and Paratyphoid Fevers.—1. Protective inoculation against these diseases is not considered necessary for personnel stationed in the United Kingdom, except in the following circumstances :—

(a) When an outbreak of any of these diseases occurs in an air force station or its vicinity, or in an area in the United Kingdom to which men on leave or duty are likely to proceed.

(b) On special instructions being issued by the Air Ministry.

2. Inoculation and re-inoculation.—Inoculation and re-inoculation, before embarkation for service abroad and while serving in a foreign station, will be governed by the following principles :—

(a) The protection given by two doses ($\frac{1}{2}$ c.c. first dose and 1 c.c. second dose, 10 days later) of T.A.B. vaccine lasts for a period of one year, and that from a single dose (of 1 c.c.) for about six months. The maximum degree of protection,

however, will not be attained unless the two doses are given this should be pointed out to persons about to be inoculated.

(b) Persons who have never been inoculated with T.A.B. vaccine should be inoculated with two doses of the vaccine.

(c) All personnel stationed abroad should be re-inoculated every year with a single dose of 0.75 c.c. of the vaccine, preferably during the cool season. (See also para. 690, clause 3.)

3. *Dosage.*—These recommendations apply also to families proceeding abroad. For women of light weight or poor physique the dose may be reduced to two-thirds of that for an adult man. For children under 10 years of age, a diluted vaccine is issued. This vaccine is supplied in *amber ampoules* for the age group 5 to 10 years, in *blue ampoules* for children aged 2 to 5 years, and the dosage is 0.25 c.c. followed ten days later by 0.5 c.c. of the appropriate vaccine.

Table Indicating Dosage of T.A.B. Vaccine

Age Group.	Primary Inoculation.		Re-inoculation yearly overseas.
	1st dose.	2nd dose.	
	c.c.	c.c.	c.c.
Adult male	0.5	1.0	0.75
Adult female	0.5	1.0	0.75
Poor physique adult	0.3	0.75	0.5
Child 15 to 18 years	0.3	0.75	0.5
" 10 " 15 "	0.25	0.5	0.3
" 5 " 10 "	0.25	0.5	0.5 * amber ampoule.
" 2 " 5 "	0.25	0.5	0.5 * blue ampoule.

* Amber ampoules contain vaccine diluted $2\frac{1}{2}$ times; blue ampoules contain vaccine diluted 10 times.

4. *Record of.*—Records of the inoculation state will be entered on Forms 48 as follows :—

(a) *Two-Dose Method.*— $\frac{1}{2}$ c.c. as first dose, followed by 1 c.c. 10 days later; the dates on which the first and second inoculations were given and the initials of the medical officer will be entered thus :—

T.A.B. } 1-8-31. A.B.
2. } 10-8-31. A.B.

(b) *One-Dose Method.*—0.75 c.c. only being given; thus :—

T.A.B. } 1-8-31. A.B.
1. }

5. *Precautions after Anti-Typhoid Injection.*—(a) In order to lessen the tendency to "reaction" after anti-typhoid inoculation, attention should be paid to the following points :—

(i) The inoculation should be done at the end of the day preferably at the week-end, so that any disability resulting may be recovered from while the individual is relatively at rest.

(ii) In warm climates all inoculations should be done during the *cool season*.

(iii) Airmen will be excused duty for 48 hours after inoculation, and *rest should be enforced*. Long train journeys are inadvisable after the inoculation, and no appointments involving exertion or fatigue should be allowed.

(iv) Instructions will be given that alcohol in any form should be avoided for at least 24 hours before and after the inoculation.

(v) If discomfort or malaise supervenes, the wisest course is to go to bed at once, and drink large quantities of bland fluids.

(b) In a large proportion of cases there is a certain amount of discomfort or transitory illness. It is impossible to foresee, in any given case, whether the reaction will be marked or trifling.

644. Diphtheria.—1. *The Schick test* is used to detect immunes and non-immunes to diphtheria. A positive reaction indicates a non-immune and a negative response indicates immunity. The test is performed by injecting 0.2 c.c. of diluted diphtheria toxin intra-dermally into the flexor surface of the left forearm, and into the right forearm 0.2 c.c. of the control (toxin heated to destroy specific activity). The injection *must* be intra-dermal and, if successfully done, causes a white wheal with orange-skin pitting about 8–10 mm. in diameter. Children between 1 and 9 years of age should not be Schick tested as they are usually non-immune, if they have not suffered from diphtheria.

2. The Schick reaction is read 48 hours later and again for confirmation on the 5th or 6th day. In the case of immunes to diphtheria no reaction is seen on either arm, or, there may be a negative (pseudo) response in allergic persons, both arms showing an equal degree of erythema (10–20 mm. in diameter) which disappears completely within three days. Non-immunes give a positive reaction, that is, the left arm shows within 48 hours a red inflamed area from 10 to 30 mm. in diameter; this fades and forms a brown, scaly area which persists for several days. Some non-immunes give a positive (pseudo) reaction, both arms showing an erythema at site of inoculation, the left being larger and more persistent than the right, moreover it shows desquamation.

3. The results of the tests will be recorded in the Inoculation table of Form 48. Entries will show the date on which the test was performed, and in the column "Nature of Vaccine" will be entered "Schick test", and in the column "Dose" will be inserted "Positive" or "Negative" as the test reveals.

4. Schick toxin is issued diluted ready for use, and, if kept in a cool place, may be used for seven to ten days from date of issue. To avoid danger of extraneous infection, the contents of each container should be used at one session if possible. Schick toxin and control are supplied in sets of 1 c.c., 5 c.c. and 10 c.c., and, in making out indents, 0.2 c.c. should be allowed for each individual to be tested.

5. *Diphtheria prophylaxis*.—Non-immunes may be given immediate but temporary protection by means of diphtheria anti-toxin (500 to 1,000 units) intramuscularly, or given delayed but more permanent immunity by the use of diphtheria toxoid-antitoxin-floccules (T.A.F.) in three doses, each of 1 c.c. at fortnightly intervals (*see* para. 687). T.A.F. usually gives little or no reaction.

6. Diphtheria prophylactic T.A.F. is supplied in containers of 1, 10 and 25 c.c. and it will keep for several months in a cool place, but a container once opened should not be re-used on account of the danger of extraneous infection. For this reason arrangements should be made to do inoculations in batches of appropriate size.

645. Scarlet fever.—1. *The Dick test* is used to detect immunes and non-immunes to scarlet fever. A positive reaction indicates a non-immune and a negative response signifies immunity. The test consists of injecting intra-dermally 0.2 c.c. of a dilution of the filtrate of a broth culture of streptococcus scarlatinæ into the left forearm in a manner similar to that adopted in the Schick test (*see* para. 644, clause 1); a control test is not essential.

2. The Dick reaction must be read 6 to 8 hours after inoculation, as it fades rapidly. Non-immunes give a positive reaction, that is, there is an erythema from 10 to 30 mm. in diameter at the site of inoculation. Immunes shew no reaction.

3. The result of the test will be recorded in the Inoculation table of Form 48. Entries will shew the date on which the test was performed, and in the column "Nature of Vaccine" will be entered "Dick test", and in the column "Dose" the word "Positive" or "Negative" will be inserted as the test reveals.

4. Diluted scarlet fever toxin will keep in a cool place for seven to ten days from date of issue. The contents of each

container should be used at one session to avoid contamination. The toxin is supplied in 1 c.c. and 5 c.c. sets, and, in making out indents, 0.2 c.c. should be allowed for each individual to be tested.

5. *Scarlet fever prophylaxis*.—Non-immunes may be given immediate but temporary protection by means of 10 c.c. of haemolytic streptococcus anti-toxin (concentrated) injected subcutaneously into the flank; or be given delayed but more lasting immunity by use of scarlet fever prophylactic injected subcutaneously in 500, 1,000, 2,000, 5,000 and 10,000 skin test doses, respectively, at weekly intervals for five weeks (*see also para. 703*). Cases shewing a marked positive Dick reaction may require a smaller dosage than the above to prevent undue reaction. There is a mild degree of local reaction in most instances; in severe reactions a general erythema, as in scarlet fever, occurs, but the case is non-infectious.

6. Scarlet fever prophylactic is supplied in containers of 1, 10 and 25 c.c., and in two strengths, "A" containing 2,500 skin test doses per c.c. and "D" containing 50,000 skin test doses per c.c. These products will keep for several months (as indicated on container) in a cool place, but a container once opened should not be re-used if possible; for this reason arrangements should be made to do such inoculations in batches of appropriate size.

646. Cholera.—1. Personnel stationed in countries where this disease is endemic should, when the situation demands, be inoculated with the appropriate vaccine in the deltoid region.

2. The dosage of cholera vaccine is 0.5 c.c. and 1.0 c.c. with an interval of ten days between the doses. It causes little reaction and requires to be done yearly where cholera is prevalent (*see para. 686*).

647. Plague.—1. In districts infested with plague, Haffkine's plague vaccine should be given.

2. This vaccine is administered in two doses—1.5 c.c. and 2.0 c.c., with an interval of ten days between the doses.

3. The injection should be given in the flank and the reaction—local and general—is usually marked, and necessitates 48 hours excused duty (*see para. 699*).

648. Influenza.—If an outbreak of influenza is to be anticipated, inoculation with 0.5, 0.75 and 1.0 c.c. of anti-catarrh (influenza) vaccine at weekly intervals for three weeks prior to

the expected outbreak will help to minimise or ward off certain complications. In some individuals this vaccine inhibits winter colds.

649. Recording of Inoculations.—If protective inoculation against any of the above diseases is performed, appropriate entries will be made in the "Inoculation table" on Form 48 as regards date of inoculation, nature of prophylactic used and dose given.

650. Expiry Date of Sera and Vaccines.—1. *Sera* maintain their full potency, if stored at a temperature between 32° and 40° F., up to the expiry date stated on the container. Thereafter, they lose potency slowly at the rate of less than 10 per cent. a year. Old stocks of sera should be used up by allowing 10 per cent. increase in volume dose for each year over the so-called expiry date.

2. *Vaccines* maintain their potency for at least a year after the date of preparation, but no definite time limit can be stated. It is, however, considered advisable to renew vaccine stocks yearly.

D.—Disinfection and Disinfestation.

655. Supervision.—All measures of disinfection and disinfestation will be carried out under medical supervision by fatigue parties from the unit concerned. (See K.R. & A.C.I., para. 1418, clause 4, regarding the duty of the C.O. in connexion therewith.)

656. Disinfection of Barrack-rooms.—For routine disinfection of barrack and other rooms, it is usually sufficient to spray thoroughly with formalin solution (see para. 666 (c)) the bedstead recently occupied by the patient, and the walls, floors and other surfaces immediately adjacent, within a radius of 6 ft. The bedstead and the adjacent woodwork and floor should then be washed with soap and hot water. When thorough disinfection is considered necessary, floors should be washed down with 2½ per cent. cresol solution, or the room fumigated with formaldehyde gas or sprayed with formalin solution. The mattress and other textile articles should be removed in sacks or sheets and treated as described in para. 659 *et seq.*

657. Special Disinfection.—In the presence of communicable disease of a virulent nature or repeated occurrence, this will include disinfection of the whole room, scraping of walls, whitewashing, distempering or papering, and will require the authority of the competent medical authority, who will make arrangements with the Works Department for the work to be carried out (see A.P. 855).

658. Materials.—All materials required for the processes of disinfection will be obtained by indent from the unit equipment officer. The employment of disinfectants for special purposes, or of disinfectants not usually supplied, will be sanctioned only after reference to the competent medical authority.

659. Disinfection of Clothing and Equipment.—All articles which may safely be disinfected by steam, should be so treated in an approved disinfector. The following are exceptions:—

(a) *Boots, Shoes, Belts, all Leather Articles, Rubber and Felt Goods.*—These should be washed over with formalin solution or $2\frac{1}{2}$ per cent. cresol solution. Exposure to the hot sun for one hour or more is equally effective. Leather will withstand a temperature of 60° C. Furs are not injured by a temperature of 60° C. for 30 minutes unless they are repeatedly subjected to it, but a higher temperature and longer exposure cause injury. Rubber mattresses should be washed with cresol solution.

(b) *Blankets and Woollen Goods.*—White blankets do not stand steam disinfection well, owing to the tendency of steam to fix stains indelibly and to alter the texture and colour. Brown service blankets are less noticeably affected. A temperature of 104° C. injures woollen articles. A temperature of 127° C. for half an hour will make flannel brittle, but if hung out on lines in the open the brittleness will be removed.

(c) *Toys, Books, Papers and other Articles*, if of little value, should be destroyed. The medical officer will report the necessity of the destruction of any article and obtain written authority for carrying it out. Only when delay in carrying out destruction would involve risk or danger to personnel will the medical officer act on his own responsibility, and be prepared to justify his action when making application for covering authority. (See K.R. & A.C.I., para. 2633 (e).)

660. Disinfection of Vehicles.—The interior of the ambulance or other vehicle used to transport cases of infectious disease should be disinfected by spraying with formalin solution or by swabbing with $2\frac{1}{2}$ per cent. cresol solution, immediately after use; all articles accompanying the patient, or used in connexion with the removal, should be suitably disinfected.

661. Hospital Bedding and Soiled Articles.—1. Bedding, clothing, etc., used by patients in hospital suffering from communicable diseases, should be removed for disinfection immediately after use. Articles which have been in intimate contact with such patients should be steeped in $2\frac{1}{2}$ per cent. cresol solution for an hour before being removed from the ward. Articles which cannot be steeped should be sprayed with formalin solution, and left for an hour before removal.

2. In hospitals the periods of exchange of bedding are normally, as follows :—

Blankets	6 months.
Bolster slips	2 weeks.
Counterpanes	1 month.
Mattress underlays	3 months.
Pillow slips	1 week.
Sheets	1 week.

If circumstances necessitate, exchanges at more frequent intervals may be made (*see* A.P. 830, Vol. I, Chapter 11, para. 103).

662. Disinfection before sending to Laundries, etc.—(*See* K.R. & A.C.I., para. 1418, clause 5 and A.P. 830, Vol. I, Chapter II, para. 84.)

1. In cases of infectious disease (whether in hospital, sick quarters or barracks), bedding, clothing and other articles which may have been exposed to infection should not be sent to the laundry or returned to store until disinfected under the supervision of the medical officer. If a case is suspected to be of an infectious nature, the bedding, clothing, etc., should be kept separate until it is known that disinfection is not required. Disinfection should be carried out as follows :—

(a) Mattresses and beds should first be sprayed with formalin solution and then removed for steam disinfection where practicable. Where steam disinfection is not practicable, they should be opened up and the stuffing as well as the covers well wetted with formalin solution. Particular attention should always be paid to the bedstead and its surroundings.

(b) The sheets and articles of clothing made of cotton and linen should preferably be boiled, but where this is not practicable they may be soaked for half an hour in a 2½ per cent. cresol solution before being washed or sent to the laundry.

(c) Blankets and woollen articles should be soaked in cresol solution for an hour before being washed or sent to the laundry.

(d) Cloth goods (including articles of uniform) should be removed for steam disinfection where practicable. Leather goods (and cloth articles where steam disinfection is impracticable) should be sprayed with formalin solution, exposed to the air and dried. Toys used by children should be burnt or disinfected.

(e) Articles infected by a dangerous infectious disease, *e.g.* small-pox, with regard to which the medical officer is satisfied that any effective mode of disinfection is not available, should be destroyed by fire. He should, however, first obtain authority to carry out the destruction, except in cases where delay

would involve risk or danger to personnel, when he should act on his own responsibility, and be prepared to justify his action afterwards when making application for covering authority.

2. Damage to articles in steam disinfectors.—At tests for disinfection of clothing, blankets, and other stores, serious damage to articles treated has been found to have resulted from the presence of caustic soda in the boiler of the disinfecter. It was found that the water used had been softened by the addition of this alkali. Caustic soda should in no circumstances be used for softening water, and, where softening of the water is necessary, the greatest care should be taken to avoid the use of any reagents which may have a deleterious effect on the articles to be treated in the disinfecter. Carbonate of soda (purified soda ash or plain washing soda) may be used for softening if it is found to be effective in preventing incrustation of the boiler. Wherever the water is known to be very hard, special advice should be sought as to the most suitable reagents for softening. Similar precautions should be taken in the selection of the composition of the wash for the periodical cleaning of the boiler.

The medical officer should see that these instructions are posted up in a prominent position for the guidance of the person operating the disinfecter.

663. Removal of Articles for Disinfection.—All articles for disinfection should be packed in sacks or sheets soaked in disinfectant solution, before being removed. The store in which infected articles were placed before removal, together with the contents, should also be disinfected; (*see* para. 660 as to disinfection of vehicles).

664. Articles for Use of Venereal and Infectious Patients.—A supply of sheets, pillow-slips, shirts, drawers, handkerchiefs and towels distinctly marked with the letter "V" will be set apart in hospitals for use by patients suffering from venereal diseases, and a supply of bedding and clothing distinctly marked with the letter "I" for the use of patients suffering from infectious diseases. These will invariably be soaked in cresol solution for an hour, then rinsed thoroughly in clean water before being sent to laundries.

All feeding utensils intended for use by venereal patients will be marked with a "V" and kept solely for their use. (*See* A.P. 830, Vol. I, Chapter 11, paras. 101 and 102).

665. Articles for Use in the Enteric Fevers.—All utensils, *e.g.*, feeding cups, bedpans and urinals, intended for use of these patients will be marked "E." The contents of bedpans and urinals will be mixed thoroughly with an equal

quantity of $2\frac{1}{2}$ per cent. cresol solution or a 3 per cent. solution of chloride of lime, and allowed to stand for an hour before being thrown down the slop sink. The bedpans and urinals will invariably be disinfected by washing with $2\frac{1}{2}$ per cent. cresol solution.

666. Disinfectant Solutions.—The following strengths are prescribed for guidance :—

(a) *Cresol Solution (1 per cent.).*

Liquor cresoli saponatus fortis $1\frac{1}{2}$ ozs.

Water to 1 gall.

Mix.

$2\frac{1}{2}$ per cent. solution requires 4 oz. to the gallon.

If sea or brackish water is used, the saponified cresol should first be emulsified with 5 to 10 times its bulk of fresh water.

(b) *Corrosive Sublimate Solution (0.1 per cent.).*

Mercuric chloride 70 grs.

Hydrochloric acid 3 drs.

Water to 1 gall.

Mix.

Tint with aniline blue, 1 gr. to the gallon.

(c) *Formalin Solution.*

Formalin (40 per cent. formaldehyde solution) 8 oz.

Water to 1 gall.

Mix.

One gallon should be used for every 400 sq. ft. of surface. Five per cent. glycerine, if added, confers viscosity and delays drying when the solution is used for spraying walls, etc.

667. Gaseous Disinfestation.—1. This method is used in barracks, buildings and ships for the elimination of vermin and rodents, and may be used for terminal disinfection in communicable diseases. All crevices should first be sealed up as far as possible, all openings closed, the floor and walls sprinkled with water, and all cupboards and drawers opened. Any articles requiring disinfestation may be put into the room and hung up loosely. Such articles, if suitable, will afterwards be removed for steam disinfection.

2. *Sulphur Dioxide.*—Three lb. of powdered or roll sulphur should be ignited for every 1,000 cub. ft. of air space on an iron receptacle, *e.g.*, shovel or tin, placed over or in another receptacle containing water. The receptacle should be placed as high as possible in the room, sulphur dioxide being a heavy gas. The room should then be vacated and the cracks and keyhole of the door sealed up. Twenty-four hours should elapse before the room is re-entered.

3. *Formalin Gas.*—About 5 oz. of formalin to $2\frac{1}{2}$ oz. of powdered crystals of potassium permanganate are required

for each 1,000 cub. ft. of air space. These should be mixed in an ordinary galvanized iron pail, the potassium permanganate being put in first and the formalin poured on the crystals. Not more than 10 fluid ounces of the solution and 5 ounces of the permanganate should be placed in one 3-gallon pail, as considerable frothing follows the mixture of these substances.

As soon as the last portion of the reagents has been mixed the operator must leave the room, seal up the door and not re-enter under 24 hours. When re-entering after this period, the nose, mouth, and eyes should be covered with a damp cloth. The remaining formalin vapour may be dispersed by sprinkling a few drops of ammonia around the room.

Formaldehyde lamps, formic lamps, and similar authorised appliances may be used.

4. *Hydrocyanic Acid Gas*.—A valuable method for exterminating bugs and rats, but one that, on account of its danger to human life, must be employed only under expert supervision, and the fumigating staff must consist of at least two persons, the operator in charge having at least two years' experience with this gas. In the United Kingdom, notice in writing of any forthcoming hydrogen cyanide fumigation, stating the area to be treated and the date and time when it will commence, will be sent to the officer in charge of the nearest police station, and to the appropriate Medical Officer of Health. The fumigant will not be liberated until all persons, other than the fumigating staff, have left the area to be treated, and all liquids and foodstuff liable to absorb the gas have been removed. Openings, cracks and crevices will be sealed so as to prevent escape of the gas from the area under treatment. All fires and naked lights in the fumigation area will be extinguished. All doors giving access to the fumigation area will be locked to prevent access. Notices in two inch high block letters containing the words: "DANGER; POISON GAS; DO NOT ENTER" will be placed so as to be visible to anyone approaching the fumigation area. No one, other than properly masked fumigating staff, will re-enter the area within a minimum period of 24 hours thorough ventilation after fumigation. In certain circumstances the period must be considerably longer, *e.g.*, in cold weather dissipation of the gas is slow, and the gas may be absorbed and held for some time by porous substances. The removal of this gas from bedding is particularly slow—bedding should, therefore, not be subjected to hydrocyanic acid gas treatment. No premises should be re-occupied after fumigation with this gas until a certificate in writing has been received from the responsible person in charge that the premises have been properly tested and are free from gas and fit for occupation. A copy of this

certificate will be sent to the Medical Officer of Health. As a further precaution some small animal such as a mouse or bird should be put into the premises prior to re-occupation.

668. Disinfection of Drains, Gutters, etc.—Complete disinfection of drains, gutters, traps, and refuse receptacles, is practically impossible. The most that can be done is deodorization, but the mere fact that gullies, drains, etc., need deodorization indicates the existence of faulty conditions. These will be investigated and corrected, and reliance placed upon free flushing with water. Disinfectant solution will not be used as a means of covering up the defects.

669. Disinfection on board Ship.—(See para. 517.)

670. Rats and their destruction.—1. In all units at home and abroad there should be an organized war against rats, for, in addition to carrying plague, they disseminate the virus of leptospiral jaundice (Weil's disease) and of rat-bite fever, and are very destructive to crops. Areas should be marked out, especially any known to harbour diseased or dying rats, and a cordon being formed around these areas, ratting parties should work from the periphery towards the centre. Various anti-rat measures should be tried and frequently changed, as rats get very wise to traps and poisons. For a few days all traps and baits should be innocuous to allay the suspicions of these rodents. Traps should be plunged into boiling water before resetting to remove all odours of previous use. Fresh tomatoes, cucumbers, fish or grain are suitable baits, and should be impregnated with such rat poisons as squills, barium, strychnine, phosphorus, arsenic or specific viruses. These baits should be placed in definite situations at night, and collected systematically in the early morning to prevent the poisoning of domestic animals.

2. Barium carbonate and squills are the safest and best recipes for rat destruction, if properly used. Rat poison baits should be freshly made, daily, as follows :—

(a) *Squill baits*

			<i>Parts by weight.</i>
(i) Red squill powder	..	..	1
Oatmeal or rolled oats	..	..	2½
Dripping	..	..	1½

Melt the dripping, and mix it well with the dry ingredients to form a thick paste.

			<i>Parts by weight.</i>
(ii) Red squill powder	..	..	1
Oatmeal	..	..	2
Castor sugar	..	..	2

Rub all ingredients through a fine sieve, and mix thoroughly.

(b) *Barium carbonate baits**Parts by weight.*

(i) Barium carbonate powder	..	1
Grated cheese or minced fish	..	1
Oatmeal .. .. .	..	1
Dripping .. .. .	..	1

Melt the dripping, and mix it thoroughly with the dry ingredients to form a thick paste.

Parts by weight.

(ii) Barium carbonate powder	..	1
Oatmeal .. .. .	..	2
Castor sugar .. .. .	..	1

Rub all ingredients through a fine sieve, and mix thoroughly.

A trace of aniseed oil to flavour may be added as an attraction.

The above mixtures should be divided into small baits, each a teaspoonful in size; these should be placed in definite situations on rat runs before dusk, and collected systematically and replaced by fresh material daily. Placing the baits inside boxes or tins with a hole just large enough for a rat to enter is a useful precaution to prevent domestic animals eating the bait. It is wise to lay a large number of baits, ten baits for every rat that it is hoped to kill, early in the rat campaign, as rats grow suspicious as their neighbours die.

3. In addition, rat-infested buildings should be fumigated with sulphur dioxide (3 lbs. of sulphur to 1,000 cubic feet of air space) and left sealed up for twenty-four hours. Rat holes or nests may be gassed by means of the exhaust gases of a motor engine or by sulphur fumes. In this case it is important to block up all holes, except the one down which the gas is led by a rubber tube.

4. Liverpool virus is a culture of certain food-poisoning organisms (*B. enteritidis gaertner group*) which cause gastro-enteritis in man as well as disease in rats. Moreover, though this "virus" will kill some rats, others are resistant and give rise to a virus-resistant progeny. This virus should not be used where there is danger of infection being spread to man and other animals through infected rats entering kitchens, larders and other food-storage places. For the above reasons, Liverpool virus is limited in its use.

5. Rats caught or killed should never be handled, except with special tongs; they should be burnt immediately, unless

orders are issued that all rats must be sent to a laboratory for examination. In the latter case the animal should be dipped in strong cresol to kill any fleas, and then a label attached to indicate where it was caught.

6. Buildings should be rendered rat-proof, where possible, by providing iron gratings to drain pipes, stopping up all rat holes, and preventing access to hollow walls.

7. All food for human consumption should be protected against contamination by rats or their excreta, as rats may carry the organisms of the *B. enteritidis* gaertner group.

8. The first essential in an organized attack on rats is simultaneity of attacks at all points, otherwise rats will merely migrate, and may return when the attack is over. At home stations this may best be achieved by co-operation with the local civil authority during National Rat Week, the date of which is announced annually by a Ministry of Agriculture and Fisheries circular.

9. Records should be kept at Stations of the approximate number of rats destroyed during each year ending 31st December, but a return should not be submitted to the Air Ministry unless instructions are given to this effect. (See also A.P. 112, Chapter XVIII, paras. 1 to 8.)

671. Prevention and Suppression of Flies.—1. Prevention.—

(a) Absolute cleanliness is necessary in all hutments, tents, mess-rooms, food stores and cook-houses, which should include the frequent scrubbing of out-of-the-way places, such as shelves, and tops and backs of cupboards. A mixture of 1 part cresol and 19 parts water should be sprayed over ground which is suspected of containing fly-breeding places.

(b) The ground in the vicinity of cook-houses and washing-up areas should not be allowed to become polluted, as the fly maggot quickly matures in such situations, especially in warm climates, or in summer, in temperate zones. Scraps of food should not be allowed to remain about the camp or mess-rooms.

(c) Food stores should be well ventilated and cool, and fly-proof gauze covering for the windows and all food cupboards should be provided.

(d) Tins of condensed milk, jam, syrup and sugar should not be left about open, as they are specially attractive to flies. Empty tins and jars should be washed clean and dipped in cresol solution before being put aside for removal.

(e) Receptacles for refuse and swill should be provided with properly fitting covers and should invariably be placed on a concrete floor or brick pavement which can be easily washed clean and treated with cresol solution.

2. *Suppression*.—(a) Traps baited with a little sugar, jam or treacle are very efficient for catching flies, which should thereafter be destroyed by burning.

(b) Wire or string, smeared with a mixture of castor oil (1 part) and resin (2 parts), should be hung about stores, kitchens and mess-rooms.

(c) Fly-papers should be provided and frequently renewed.

(d) Sprays such as "Flit", "Vermicene", or "Clymax" may be used undiluted, or "Pyrocide 20", diluted as at para. 713 clause 3. If a non-inflammable insecticide is required, the following mixture should be used:—

Kerosene	..	..	..	..	43.2 per cent.
Concentrated extract of Pyrethrum				5.8	„ „
Oil of citronella	..	..	..	2.0	„ „
Carbon tetrachloride	..	..	..	49.0	„ „

These are best sprayed through a high pressure sprayer, a dessert-spoonful of insecticide being used for every 1,000 cub. ft. to be treated.

(e) The anti-fly poster (Form 1027) should be freely exhibited in all units.

672. Destruction of Cockroaches.—1. The presence of cockroaches is very undesirable. They contaminate food; their foetid odour is repulsive; they may do actual damage; their presence in greater or less numbers may produce such a mental effect upon the inhabitants of a house as to react detrimentally upon the general health and well-being; and finally, if measures are not adopted for their eradication, neighbouring buildings will in time become infested. Methods of control are not, however, always easy, for the insects are wary, and it is a difficult matter to reach them.

2. It is generally in old buildings, or such as have many cracks and crevices about the walls and floors, that the cockroach most abounds. All places which are likely to give it a chance of entering should be sealed with cement. Special attention should be paid to the brick and tile work around fireplaces and at the backs of cupboards, as well as to the entrance-holes of water and gas-pipes. The skirting-boards should also be made to fit close to the floor. Plaster of Paris, Keen's Cement, "plastic wood", or a home-made filling consisting of pulped newspaper to which enough glue or size has been added to make it "set" when dry, should be freely

used to make good cracks and crevices according to circumstances. When this has been done, one of the following methods of control should be adopted :—

(a) Powders are successful in ridding kitchens and stores of cockroaches, provided the treatment is persisted in. The powder should be sprinkled on floors and shelves, daily, for a week, then once weekly so long as cockroaches are seen ; the dead should be swept up and burned each morning. Care should be taken that these powders do not come in contact with food. Suitable powders are :—

(i) Sodium fluoride	..	..	..	3 parts.
Pyrethrum	..	..	..	1 part.

(ii) Sodium fluoride	..	..	..	4 parts.
Powdered liquorice	..	..	..	$\frac{1}{2}$ part.
Powdered borax	..	..	..	1 part.
Pyrethrum	..	..	..	4 parts.
Cornstarch	..	..	..	2 parts.

(b) Sprays suitable for stupefying or killing cockroaches can be made up as follows :—

(i) Vermicene or clymax undiluted, a tablespoonful of either being used per 1,000 cub. ft. to be treated.

(ii) A mixture of

Petroleum	..	..	..	200 c.c.
Concentrated extract of Pyrethrum	..			5 grammes.
Carbon tetrachloride	..	..	..	800 c.c.

or

Oil of Wintergreen	..	..	..	1 part.
Paraffin Oil	..	..	..	99 parts.

(c) Fumigants should be avoided in food stores.

3. Badly infested houses should be evacuated, as it is impracticable to carry out thorough disinfection while they are occupied. To permit of easy access to the breeding places of cockroaches, skirting boards and linoleum should be removed; it may also be necessary to lift floor boards here and there so as to spray the intervening space between floor and ceiling. Rooms upstairs as well as downstairs should be treated, and spraying should be repeated on several days, otherwise disinfection will be incomplete. In addition, furniture, especially

table drawers, should be thoroughly treated. Fluid sprays are most efficacious, but liable to stain walls, therefore quarters so treated should be re-decorated internally afterwards.

E.—Measures to be adopted in certain Diseases

677. 1. The secret of any prophylactic campaign against communicable disease is to know the various links of the etiological chain, and to sever as many of these as possible. It must be remembered that influences of nature are always at work and may repair all or some of these links, so that preventive measures, if they are to attain any semblance of success, must be continuous. It is imperative that this aspect of medicine should be daily borne in mind by a medical officer.

2. The chief factors concerned in the etiology of the communicable diseases of mankind are man, insects, and contaminated food and water supplies. The human "carrier" plays a most important part in the perpetuation and spread of such diseases (*see* para. 618, clause 2).

3. Table I demonstrates the main routes by which the infective agents of various diseases may leave the human body, and indicates on general lines the preventive measures that should be adopted for each group of diseases. In addition, to aid in the general preservation of health, there are certain dictates of common sense that should be constantly brought to the notice of all, especially those serving in warm climates. These are—

- (a) to avoid undue fatigue, excesses and chills ;
- (b) to be cleanly in all habits ;
- (c) to drink water from officially approved supplies only ;
- (d) to refrain from alcoholic drinks until after sundown ;
- (e) to eat only cooked foods and fruit with good skins ;
- (f) to avoid bazaars and crowded spaces ;
- (g) to wear sensible clothing and change frequently ;
- (h) to get protective inoculations annually ;
- (i) to refrain from concealing disease ;
- (j) to wage a constant war on flies, fleas, mosquitoes, sandflies, lice, bedbugs and rats ;
- (k) to keep the mind occupied and avoid panic ;
- (l) to keep the bowels open daily, and the skin active ;
- (m) in short, to preserve a healthy mind in a healthy body.

TABLE I.

Type of Carrier.	Naso-pharyngeal.	Hæmal.	Fæcal.	Urinary.	Integumentary.
Medium of Spread.	By droplet infection in talking, coughing, sneezing, kissing.	By agency of biting insects; flies, fleas, lice, mosquitoes, ticks, mites, bedbugs.	By contamination of soil, food, water and hands.	By contamination of soil, food, water, clothing and skin.	By direct contact or fomites.
Diseases Spread.	Cerebro-spinal fever. *Diphtheria. Encephalitis lethargica. *Influenza. Measles. Mumps. *Plague (pneumonic). *Pneumonia. Poliomyelitis. *Scarlet fever. Tuberculosis. *Whooping cough.	Blackwater fever? Filariasis. Leishmaniasis. Malaria. Phlebotomus fever. *Plague. Relapsing fever. Trench fever. Trypanosomiasis. Typhus. *Yellow fever. Anthrax (possibly).	Ancylostomiasis. Bilharziasis. *Cholera. Diarrhea. *Dysentery. *Enterica. Tuberculosis. Worms (intestinal).	Bilharziasis *Enterica. Undulant fever. Tuberculosis. Venereal disease. Weil's disease.	Chicken-pox. Enterica (fever). Undulant fever (hands). *Plague <i>via</i> fleas. Relapsing fever <i>via</i> lice. Ringworm. Scabies <i>via</i> mite. *Small-pox. Trench fever <i>via</i> lice. Typhus fever <i>via</i> lice. Venereal diseases. Weil's disease.

<i>Prevention. To detect carriers</i>	Examine naso-pharyngeal swabbings and sputum.	Examine blood and tissue films for parasites.	Examine faeces and urine, especially of handlers of food.	Examine clothing and skin for parasites, macroscopic and microscopic; also blood and urine where indicated.
<i>General measures</i>	Free ventilation. Space out. Outdoor exercises. Naso-pharyngeal disinfection. Supervise milk supply.	Anti-insect measures. Protect healthy and diseased persons against the bites of insects by use of repellants and netting.	Proper disposal of all faeces and urine. Cresol latrines and ground around. No one to enter latrine area with bare feet. Potassium permanganate for hands. Protect food against insect and dust contamination. In tropics avoid eating uncooked vegetables (salads). Sterilise and protect water supplies. Segregate. Disinfect all excreta, bedding, clothing, feeding utensils.	Frequent bathing and clean clothing. Weekly skin inspections. Weekly disinfection. Healthy exercises. Efficient early treatment room.
<i>When case occurs</i>	Isolate. Disinfect room, clothing, bedding, feeding utensils.	Disinfection of person, clothes, bedding, room in cases of lice and flea-borne infection. Guard against infection.	Should protect their clothes and person against all infective discharges. Disinfect hands.	Disinfect room, clothing, bedding, feeding utensils. Ointments or oils to prevent spread of infection. Wear gown and frequently disinfect hands. Disinfect where indicated (typhus, &c.).
<i>Attendants on sick</i>	Use gowns and face masks.			

*Protective inoculation should be practised where applicable.

Attendants on sick, if possible, should be chosen from those who have gained immunity to the disease.

678. The following brief descriptions of preventive measures applicable to certain of the commoner communicable diseases are given in order to form a basis from which medical officers can initiate necessary action, namely :—

(a) The continual search for and elimination of "*carriers*" of disease ;

(b) The adoption of various measures to *prevent infection* of air, soil, water, food, clothing and other articles of common use ; also the *immediate protection of man* ; and, when these precautions fail,

(c) The *isolation of diseased persons*, suspects and contacts.

679. Acute Polio-myelitis.—1. This disease occurs in the tropics and sub-tropics though it is much commoner in temperate zones, where it occurs chiefly in the autumn. Children are far more frequently affected than adults. The virus is spread apparently by droplet infection ; there is no definite evidence of insect transmission. The incubation period is 2 to 14 days. The lesion may be a polio-myelitis, polio-encephalitis or polio-encephalo-myelitis.

2. *Carriers.*—The virus is present in the naso-pharynx, and infection may be spread by the droplet method both by patients and apparently healthy carriers.

3. *Prevention of Infection.*—Direct contacts should be segregated for a fortnight and practise nasal douching daily with a 1 in 5,000 solution of potassium permanganate in 0·8 per cent. sodium chloride. Beds should be spaced out as far as possible with the heads of alternate beds in opposite directions, and barracks should be freely ventilated. All personnel should be encouraged to take outdoor exercises, but to avoid fatigue during the epidemic. Attendants on the sick should wear gauze face-masks. All gatherings of young children should be avoided as far as practicable in epidemic periods.

4. *Isolation.*—All cases should be isolated for six weeks. Lumbar puncture should be done for diagnostic and therapeutic purposes, and 10 to 30 c.c. of convalescent serum should be given intravenously. All discharges and fomites should be treated as infectious.

680. Ancylostomiasis.—1. This disease is prevalent in the tropics and subtropics wherever there is adequate moisture and warmth for the larval form of the worm to develop from the egg passed in human fæces, especially that of natives. The mature larva can infect man either through the mouth by way of impure drinking water or fresh vegetables such as salads,

or through the unabraded skin, usually when walking bare-footed or imperfectly shod, on contaminated soil such as exists in and around badly controlled latrines.

2. *Carriers* of the ancylostome should be sought for by periodic examination of the fæces of personnel, especially amongst the natives. Those found to be carriers should be kept under close observation until freed from their parasites by means of systematic treatment with thymol, carbon tetrachloride or oil of chenopodium.

3. *Prevention of Infection*.—To prevent the fæcal infection of soil, water, or vegetables, efficient conservancy methods should be instituted. The protection of man in infected areas should be attempted by the provision of water-tight footwear, by killing the larvæ in bathing water with cresol (1 in 10,000 dilution), by chlorinating or boiling all drinking water, and by cooking all vegetables.

4. *Isolation*.—Those suffering from the disease should be treated with at least two courses of thymol or carbon tetrachloride, and kept under close observation until pronounced free from infection. Special attention should be paid to the disinfection and disposal of their fæces, and the washing of their underclothing and bed-linen.

681. Anthrax.—1. Among service personnel anthrax usually occurs in the form of a malignant pustule, affecting the hands or arms of those who have been in close contact with infected animals or hides, or on the faces of those using infected shaving brushes. The entrance of the anthrax bacillus is usually through an abrasion of the skin or mucous membrane.

2. *Carriers*.—Anthrax is not usually transmitted from man to man, but chiefly by means of infected wools, hairs, and hides of sheep and cattle, especially those obtained in 'Iraq, Persia, Russia, China and India. The anthrax spores can remain alive in such materials for years, even if the hairs or wools are converted into shaving brushes, tooth brushes or carpets.

3. *Prevention of Infection*.—All personnel should be informed of the danger of infection with anthrax. All wounds, bites and abrasions should be treated as soon as possible with iodine or spirit. By this means much can be done to prevent not only anthrax, but also sepsis and tetanus.

Shaving and tooth brushes should be issued with identification numbers marked on them and be supplied from one common source. Before distribution, sample brushes from each batch received from this source should be forwarded to a competent bacteriologist for a certificate of freedom from anthrax. Sterile all-bristle brushes should be used, or better

still brushless shaving cream. Barbers' establishments should be inspected frequently. Infected brushes should be burnt immediately, and the supply of all brushes stopped until further orders.

The bodies of animals dying of anthrax or suspected anthrax should be burnt, or buried intact six feet below the ground surface and thickly covered with quick-lime. The burial place should be well away from all dwellings and water supplies. Camps should not be pitched on such sites. Byres or stables should be scrupulously disinfected.

4. *Isolation* of a case of anthrax should be complete; clothing and bedding being disinfected. All dressings should be burnt. If Sclavo's anti-anthrax serum is not available, the competent medical authority will be asked by signal for the necessary serum to be procured and forwarded by the quickest practicable means of conveyance; meanwhile intravenous N.A.B. injections should be given.

When a case of anthrax occurs, the competent medical authority concerned and the Air Ministry should be notified at once by signal, and the supply of all brushes stopped until further orders.

682. Bilharziasis or Schistosomiasis.—1. The life history of the schistosome is the clue to the prevention of this disease, which is widespread in Egypt and occurs in certain areas of 'Iraq and Aden; whereas, the japonicum type is encountered in the Far East. The adult schistosomes live chiefly in the portal veins of man, and migrate to the veins of bladder and rectum to lay their eggs. The eggs pass out in the urine and fæces, and, on reaching fresh water, rupture to liberate a free-swimming, ciliated embryo or miracidium, which perishes unless it can enter the appropriate fresh-water snail within 48 hours. In the snail's liver it develops into sporocysts which produce bifid-tailed cercariae in enormous numbers. These cercariae are liberated into fresh water where they die unless they can penetrate the skin or mucous membranes of man within 72 hours. After entering man the parasite proceeds by way of lymphatics and blood vessels to the liver, and takes about 8 weeks to attain maturity. There are four chief factors in the etiological chain—the parasite, fresh-water snails, fresh water and man. Preventive measures must aim at breaking the links of this etiological chain in the following manner:—

2. *Carriers.*—In endemic areas the urine and fæces of the native employees, and of British personnel showing albuminuria, should be examined periodically for the presence of schistosome ova. Men apparently healthy are often carriers. These should be isolated and cleared of their parasites by means of tartar emetic, fouadin or neostibosan.

3. *Prevention of Infection*.—Strict conservancy methods should be adopted for the disposal of all urine and faeces to prevent the contamination of water. No promiscuous micturition or defaecation should be allowed.

Bathing should be prohibited in schistosome areas, except in waters officially approved. The absence of the special snail in the immediate vicinity of a water does not mean that there is no risk of infection, as the cercariæ may be carried for 20 to 30 miles down stream and still remain infective.

Infective forms (cercariæ) of the schistosome that might still gain entrance to the water supply should be eliminated by storing the water for over 48 hours, by boiling, or by adding sodium bisulphate (1-1,000) before use; to water for non-drinking purposes cresol should be added in the proportion of one part per 10,000.

Fresh-water snails (*Bullinus* and *Planorbis*) should be destroyed as far as possible by having alternate courses for the water supply, so as to leave each water-bed dry for at least 24 hours; drying kills the snails. In addition, sanitary parties wearing rubber waders and rubber gloves should collect these molluscs and destroy them. Remember that the infection of man usually takes place through the unabraded skin and mucosa.

Wire screens, 16 meshes to the linear inch, should be placed at intervals along infected water-ways to hold back snails; this aids their collection and destruction by sanitary parties.

3. *Isolation*.—Wherever a case of the disease occurs, the competent medical authority of the area will be notified by signal, all bathing, wading and fishing stopped, and all water supplies appropriately treated to prevent infection. The patient should be admitted to hospital for treatment.

All persons found to be infected with schistosomes should be kept under close observation and treatment until their urine and faeces have been shown to be free from schistosome ova for at least a fortnight; after that, they should be examined periodically, including specimens obtained by prostatic massage.

683. Blackwater Fever.—1. This disease is characterized by a haemoglobinuria, which is thought to be due to repeated attacks of malaria leading to the production of auto-haemolysins. Recent researches tend to contra-indicate a specific infection. Blackwater fever is of common occurrence in Central Africa and Macedonia.

2. *Carriers* of this disease are unknown, but all persons harbouring malaria parasites should be considered as potential sources of infection.

3. *Prevention of Infection*.—In the absence of proof of the cause of this disease, all aims at prevention should be directed towards the construction of healthy camps and habitations, good food and cooking, and war on all insect life, especially mosquitoes and ticks. Anti-malarial measures should be carefully carried out (*see* para. 695, clause 3). Fatigue, over-indulgence in alcohol, and chills should be avoided. All patients suffering from attacks of a malarial nature should be put to bed at once and kept there under appropriate treatment for at least three days.

4. *Isolation*.—All cases of blackwater fever should be properly protected with a mosquito net.

As soon as convalescence is established the patient should be removed from the endemic area, preferably to the United Kingdom, and should never return to a malarious district.

684. Cerebro-spinal Fever.—1. This disease is due to the *meningococcus* (*Neisseria meningitidis*), which inhabits the naso-pharynx of carriers and cases. The percentage of carriers varies from time to time, being highest at epidemic periods, that is, when there is local overcrowding. The infection is air-borne by droplets emitted by carriers during talking, coughing and sneezing, especially under conditions of local overcrowding as are liable to occur in congested barracks, canteens, cinemas and charabancs during inclement weather. Recruits, owing to their lack of herd immunity, are specially liable to contract this disease. The meningococcus usually causes a meningitis, but a septicaemic form is not uncommon. Cerebro-spinal fever may occur in all climates, being commonest at times of the year when local overcrowding is greatest, that is, during winter months in this country, when it is cold and foggy, and there is a tendency to crowd round fires and to keep windows shut.

2. *Carriers*.—When an outbreak of cerebro-spinal fever occurs, it is not necessary to segregate the contacts or take naso-pharyngeal swabbings from them, as carriers are usually much more numerous than cases, often in the proportion of from 10 or even 30 to 1. The general preventive measures detailed in clause 3 below, if properly carried out, suffice to lessen the number of carriers and stop the spread of infection.

3. *Prevention of Infection*.—This is spread chiefly by aerial contamination directly from person to person; overcrowding should therefore be avoided. The most liberal supply of fresh air should be prescribed for everyone. Barracks should be freely ventilated, especially sleeping-rooms at night; when possible, windows should be fixed in the open position. Beds should be spaced at least 3 feet apart to prevent "droplet" infection; extra buildings may be required for temporary use

for this purpose. Extra blankets should be issued as required, so that the men may be kept warm while the barrack-room is cooled with fresh air, which is injurious to the meningococcus. Overcrowding in canteens, cinemas, churches, dining-halls and lecture-rooms should be avoided. Outdoor sports should be encouraged.

All personnel should pay particular attention to nasal and oral hygiene, and be instructed to place a hand or handkerchief over their nose and mouth when sneezing or coughing, to prevent the broadcasting of germs. They should be made to irrigate nose and throat with a solution of 1 in 5,000 potassium permanganate in 0·8 per cent. saline twice daily, or else be treated in a special hut with zinc sulphate vapour (1 per cent.) for a quarter of an hour daily.

4. *Isolation*.—All cases of cerebro-spinal fever and suspects thereof will be isolated immediately. The competent medical authority and the Air Ministry should be informed by signal (see K.R. and A.C.I., para. 1418, clause 6). Lumbar puncture should be performed as soon as possible for diagnostic and therapeutic purposes, and anti-meningococcus serum or antitoxin administered intrathecally and intravenously. Sulphanilamide is now under trial and is giving promising results in the treatment of this disease.

Attendants on meningococcus cases should be over the age of 25, if possible, to lessen the risk of infection, as susceptibility is low above that age. They should wear gauze face-masks when attending cases.

685. Chicken-pox.—1. This disease must be distinguished from small-pox, especially as it may appear in those who have been vaccinated. In ships coming home from the Orient, cases of mild small-pox which are mistaken for chicken-pox, occur from time to time.

2. *Carriers*.—There is evidence that cases of herpes zoster should be treated as carriers of chicken-pox, or as sufferers from a modified form of the disease.

3. *Prevention of Infection*.—Immediate contacts who have not had this disease should be medically examined daily for 21 days, but no segregation is necessary except for children (see para. 622). The quarters in which a case has occurred, together with all clothes and bedding, should be thoroughly disinfected.

All persons attending cases of chicken-pox should be chosen from those who have been vaccinated against small-pox within a period of five years.

4. *Isolation*.—Every case of chicken-pox will be isolated and most carefully investigated to avoid missing instances of mild small-pox, and thus spreading that disease. Until a

definite diagnosis is made, all cases of vesicular eruption should be isolated and treated on the lines of the more severe disease, but the relatives should not be informed unless the diagnosis is certain. All discharges and fomites should be treated as infectious. Isolation should be maintained for three weeks.

686. Cholera.—1. Cholera is a disease closely associated with man and his food, so that preventive measures should aim at establishing a wholesome food and water supply, increasing the resistance power of man to the disease, and the isolation of cholera patients and carriers. Common vehicles of infection are water, milk, cream, ices, mineral water, uncooked vegetables and fruit, especially salads.

2. *Carriers* of the *Vibrio cholerae* should be carefully looked for, especially among those engaged in handling food. Personnel in warm climates should be warned that all cases of diarrhoea should report sick at once; in view of the importance of premonitory diarrhoea, especially in the hot weather, all such cases should immediately be isolated and treated as cholera—dysentery—enteric suspects, during outbreaks of these diseases.

3. *Prevention of Infection.*—The infection of food and water occurs mainly by contamination with choleraic discharges, therefore there should be the strictest supervision of conservancy methods, and adequate protection of faeces and food from all insects, especially flies.

All vegetables should be cooked.

Salads should be forbidden, unless the vegetable ingredients are efficiently cut up and soaked in 1 in 8,000 permanganate solution for two hours.

Fresh fruit should not be eaten except those with thick skin such as bananas and oranges, unless they are specially prepared by soaking in permanganate solution. Fresh grapes, dates and melons are particularly prone to harbour cholera germs.

All personnel should be prohibited from buying food or drink anywhere but in Service canteens. Personnel will be warned that—

No food or drink should be consumed in bazaars; and that ices are especially dangerous.

Itinerant food vendors should not be allowed to frequent station and camp areas.

All milk and drinking water should be boiled, and then kept protected against dust and fly contamination until consumed.

Cookhouses and personnel engaged in handling general food supplies should be dealt with as in A.P. 1269A.

No one who has suffered from the enteric group should be employed as a cook or handler of common food supplies or in connection with drinking water duties unless free from infection.

All bathing should be prohibited during an epidemic, and during the warm weather, except in officially sanctioned waters.

The resistance of man to cholera lies chiefly in the possession of a healthy stomach; the normal acidity of the gastric juice is sufficient to kill the cholera vibrio. Excess of alcohol and over-chlorination of drinking water are apt to lead to gastritis and so lower this resistance.

Anti-cholera vaccine increases immunity to this disease and should be given at least a month before the cholera season is expected, and repeated every two or three months, if necessary, as the immunity is short-lived. There is practically no reaction, so personnel do not object to re-inoculation.

For the sanitary regulations with regard to cholera applicable in accordance with the International Sanitary Convention for Aerial Navigation, *see* A.P. 1269A

4. *Isolation* of cases of cholera and all suspects will be complete. Those in attendance on cholera patients will have their mouths and noses protected with gauze masks to protect against the vomit, wear a waterproof apron under their gown, and carefully disinfect their hands throughout their duties. All discharges from the case should be protected against flies and immediately disinfected.

The quarantine period for contacts and suspects should be at least six days. Fæces should be examined daily for the cholera vibrio.

687. Diphtheria.—1. Diphtheria is rapidly ceasing to be a cause of sickness in the Service, owing to the policy of Schick testing recruits, apprentices and boys on entry, and of giving appropriate prophylactic inoculation to those found to be non-immune. The disease is spread chiefly by droplet infection.

2. *Carriers.*—Now that the majority of the younger personnel has been protected against diphtheria by protective inoculation where necessary, there is no need to search for diphtheria carriers unless more than two cases occur at or about the same time in the same unit. Chronic carriers of virulent diphtheria bacilli will be brought before a medical board with a view to invaliding from the service.

3. *Prevention of Infection.*—The routine medical inspection of men carried out when they return from leave or join the station should aid in the detection of early cases of infectious disease contracted outside the station.



When a case of diphtheria occurs, the room and bedding should be disinfected.

(a) In a unit where the majority of the personnel has been Schick tested and immunized if necessary, there is no need to take any further action other than to examine clinically the throats of direct contacts, and to see that they irrigate their throats and noses with a 1/5,000 solution of potassium permanganate in saline, daily, for a week.

(b) In units where most of the personnel have not been Schick tested or protected against diphtheria, the Schick test should be applied to all contacts at least, to detect the immunes and non-immunes to this disease (*see* paras. 644 and 649). The immunes should be discharged to duty. The non-immunes should be given immediate, but temporary, protection by means of diphtheria anti-toxin (500 to 1000 units) intramuscularly, then returned to duty. All contacts should have their throats examined and irrigated, daily, for a week (as under (a)).

All attendants on diphtheria patients and suspects should if possible, be diphtheria immunes. They should wear overalls and gauze face-masks, and disinfect their hands and naso-pharynges after attending the patients and before going off duty.

All milk should be pasteurized or boiled during an outbreak.

Cats and dogs should not be allowed in barracks, sick quarters, or hospitals, as they are liable to spread the infection.

4. *Isolation.*—All cases of diphtheria and suspects will be isolated immediately. Each patient should be given, after desensitization, 10,000 units or more of diphtheria anti-toxin as soon as possible; the average daily intramuscular dose is 16,000 units for a mild case, 24,000 units for a moderate case, and up to 48,000 units for a severe one; every 24 hours' delay in beginning this treatment increases the death rate by about 3 per cent. Further doses of anti-toxin should be administered as required. In cases of clinical diphtheria, serum should be given immediately and not delayed pending the receipt of the laboratory report on the throat swab.

No diphtheria patient should be discharged from hospital as free from infection until two weeks after all symptoms of the disease have ceased, especially nasal or aural discharge, and until naso-pharyngeal swabbings collected for three consecutive days, after local treatment has ceased, are negative to virulent diphtheria bacilli.

688. Dysentery.—1. Dysentery is a symptom-complex of many diseases, but for practical purposes it is classified into

three main types—bacillary, protozoal and helminthic. Bacillary dysentery frequently occurs as an epidemic; the others are endemic and usually sporadic.

2. *Carriers*.—Bacillary dysentery is usually carried by convalescents from the disease for a period of six weeks, in some instances for considerably longer periods. Protozoal or amoebic dysentery carriers may, or may not, have suffered from the disease, and are liable to remain carriers for many years; these remarks apply equally to the helminthic disease. In all three forms the infective agent is transmitted in the fæces of man. The bacillary and protozoal types are contracted usually by partaking of food or water infected by the agency of human or fly carriers.

The carrier problem should be energetically tackled, first, by the efficient treatment of all cases of dysentery as they arise; secondly, by the examination of at least seven consecutive daily specimens of fæces after all symptoms of the disease have disappeared, the first and last specimens being obtained by the use of calomel and salts; and thirdly, by periodic examination of fæces of all personnel engaged in handling food supplies.

No one who has suffered from dysentery will be employed in a cookhouse or in the handling of food (*e.g.* mess waiter) until laboratory examination proves freedom from infection.

3. *Prevention of Infection*.—Those with a previous history of dysentery should have at least three consecutive daily specimens of their fæces forwarded to the laboratory for examination before proceeding abroad.

Special attention should be paid to the disposal of all fæces, which should be burnt or disinfected, and efficiently protected against flies and other insects.

Water should be protected from flies and dust, especially after chlorination or sterilization.

Kitchens, larders and dining-halls should be fly-proof and the fly-proofing should be kept in repair. Food should be protected against flies—*e.g.* meat, bread and cakes by netted guards; jam and sugar by well-fitting, self-closing lids. Salads should be forbidden, unless the ingredients are cut up and soaked in 1 in 8,000 potassium permanganate solution for two hours before partaken. All personnel should be instructed not to partake of ices, sweetmeats and drinks in the bazaar.

Scrupulous care should be exercised in the inspection of all engaged in handling food (*see* A.P. 1269A).

A prophylactic vaccine for bacillary dysentery has been prepared. This vaccine should only be used in conjunction with the services of a pathologist.

4. *Isolation*.—All cases of diarrhoea abroad should be treated as dysentery—enteric—cholera suspects, especially in epidemic periods. These and patients with known dysentery should, if possible, be treated in a special room or ward; their bed pans should, not forgetting the handle, be protected against flies. Isolation should be maintained until at least seven consecutive daily examination of faeces have proved negative to pathogenic bacterial, protozoal or helminthic infection.

Quarantine of contacts is unnecessary unless there is a large epidemic, in which case, measures should be adopted as for cholera (see para. 686).

689. Encephalitis Lethargica.—1. Encephalitis lethargica is due to an ultra-microscopic filterable virus, which is conveyed from person to person by droplet infection from the nasopharynx. Infectivity is low, cases being usually sporadic, the majority occurring in winter or spring; epidemics, however, occur at times. All ages are susceptible, many cases being atypical and only recognised, perhaps years later, when sequelæ develop. The chief sequelæ are Parkinsonism and mental changes, which completely alter the individual's character. The immediate mortality rate is high, at least 35 per cent., and the majority of the survivors develop tragic sequelæ.

2. *Carriers*.—Many apparently healthy persons would appear to be oral carriers of the virus of this disease, especially during epidemics. Therefore, when a case occurs, all contacts should be segregated. Persons found suffering from herpes febrilis should be isolated, as this appears to be a condition produced by the virus of encephalitis lethargica.

3. *Prevention of Infection*.—Direct contacts should be made to practise nasal douching or pass through a spray chamber (see "Cerebro-spinal Fever", para. 684, clause 3), daily for a fortnight. In addition, under careful observation, urotropine 100 grains thrice daily, preceded by 60 grains each of sodium bicarbonate and potassium citrate may be given for a fortnight to all immediate contacts, as this drug has been shown to be an efficacious prophylactic in the somewhat similar disease, acute poliomyelitis. A careful watch should be kept for such early or transient symptoms of the disease as sore throat, "influenza", hiccup, headache or lethargy among the contacts and among men reporting sick on parade. The whole personnel should be encouraged to indulge in outdoor exercise, the beds should be spaced out and barracks freely ventilated. Everyone should avoid fatigue during an epidemic. Attendants on the sick should wear gauze face masks.

4. *Isolation*.—All cases and suspects will be isolated immediately; the competent medical authority should be notified. Lumbar puncture should be performed for diagnostic and therapeutic purposes. All discharges and fomites should be treated as infectious.

690. Enterica.—1. The term "enterica" includes typhoid and the paratyphoid fevers. The occurrence of these fevers is an indication of defective sanitation. Sudden and large epidemics are usually due to contaminated water supply, more localised and smaller outbreaks to infected food (especially milk, salads and ice cream); sporadic cases arise frequently from the infected hands of carriers, especially cooks.

2. *Carriers*.—In warm climates, especially where there is no water carriage system of sewage disposal, a careful eye should always be given to the question of carriers. About one person in a thousand is a typhoid carrier and is the potential source of an enteric epidemic.

The detection and elimination of enteric carriers should be performed on lines similar to those laid down for dysentery. There should be early diagnosis and efficient treatment of all cases of enteric fever; during convalescence and prior to discharge from hospital at least seven, preferably fourteen consecutive daily specimens of faeces and urine should be examined, while in those developing cholecystitis the number of examinations should be increased to 20 or 30 and bile obtained by duodenal intubation should also be cultured for the enteric group of organisms; the faeces and urine of all engaged in handling food should be examined periodically for organisms including those of the enteric group (*see* A.P. 1269A).

3. *Prevention of Infection*.—Those with a previous history of enterica should not be allowed to proceed abroad until their faeces and urine have been declared free from infection by a Service pathologist.

Special precautions should be taken with regard to the disposal of faeces and urine, the purification and sterilization of water supplies, the protection of food against dust, flies and all insects. In addition, instructions should be issued in routine orders, at least once annually, as to the dangers associated with the ingestion of salads, watercress, uncooked fruit, shellfish, and especially ices, butter, milk and drinks that may be obtained in bazaars (*see* under "Cholera" para. 686, clause 3).

Kitchens, cookhouses and those employed therein should be dealt with as detailed in A.P. 1269A. No one who has suffered from the enteric group should be employed as a cook or handler of common food supplies or in connection

with drinking water duties unless free from infection. Food should be protected as described under "Dysentery", para. 688, clause 3.

Prophylactic inoculation with T.A.B. vaccine should be administered to all personnel, and re-inoculation should be carried out every 12 months abroad, preferably in the cold season (*see* para. 643, clauses 2, 3 and 5).

Attendants on enteric cases should wash and disinfect their hands after touching the patients, bedpans, urine bottles and feeding utensils.

4. *Isolation* of enterics and carriers will be complete; the feeding utensils of each patient should be clearly marked and boiled after use (*see* para. 665). Fomites, fæces, urine, sweat and sputum should be regarded as infectious. Excretions and clothing should be treated with 2½ per cent. cresol for two hours before disposal; bedpans and urine bottles should be protected against invasion by insects. Isolation should be continued for at least three months. Patients should not be discharged to duty until certified free from infection (*see* clause 2 above).

The diagnosis of each case of enterica should be verified by blood, fæces and urine culture; should these tests fail, by agglutination, or, where laboratory facilities do not exist, by means of Marris' test, but not during the heat-stroke season.

Typhoid, but not paratyphoid, cases may be treated with concentrated anti-typhoid serum (globulin solution) given intramuscularly or intravenously in 25 c.c. doses daily for three consecutive days, as early in the disease as possible. Care should be taken to desensitize patient to horse serum, as a preliminary measure.

The quarantine of suspects should be maintained until their blood, fæces and urine have been systematically examined for pathogenic infection, and proved negative.

691. Food Poisoning.—1. Outbreaks of food poisoning should be investigated immediately, as the cause is often evanescent, and, if not found, may delay the adoption of the correct line of treatment. Briefly, food poisoning is most commonly seen in connexion with preserved food and includes intoxications due to the ingestion of and internal action of

- (a) metallic poisons derived from the tin container and those added as preservatives or even for malice;
- (b) some game and fish at certain seasons;
- (c) certain vegetables and fungi eaten in mistake for innocent ones;
- (d) various micro-organisms and their toxins, especially *B. enteritidis* of Gaertner and *Clostridium botulinum*.

In addition, it should be recollected that infections such as typhoid, paratyphoid, dysentery, diphtheria, scarlet fever, tuberculosis and undulant fever may be spread by the agency of infected food.

Articles of diet most likely to cause food-poisoning are tinned food, sausages, meat pies, stale fish, shell-fish, ice cream, cheese and potatoes.

2. *Carriers*.—Human carriers of *B. enteritidis* of Gaertner occur; in food outbreaks due to this group of organisms, those engaged in handling food should be bacteriologically examined. Animals, domestic and otherwise, may harbour organisms of the Gaertner group or *Cl. botulinus*; the flesh of these animals when ingested, or their excreta by contaminating other food, flesh and vegetables, may cause food poisoning in man.

3. *Prevention of Infection*.—All foodstuff should be examined as a routine by the medical officer and responsible messing officer. A careful watch should be kept on tinned foods, especially as regards the brand used, signs of blowing, colour of inside of tin, firmness, colour and odour of contents. Periodically, samples should be submitted for laboratory examination. Tinned material should not be left in the tin after opening and should be consumed within 12 hours. Only local fish should be eaten in warm climates. The centre of sausages should be examined for signs of putrefaction. Slaughter houses engaged in killing animals for the Service should be kept under constant supervision, clean, free from dogs, rodents, birds and flies. All food should be properly cooked when fresh, then protected against contamination.

All personnel should be careful in their choice of food, especially abroad. Attendants on patients should take similar precautions to those detailed for enterica or dysentery.

4. *Isolation*.—There is no need to isolate definite cases of food poisoning, but the competent medical authority and pathologist concerned will be notified immediately. Vomits and excreta should be treated as infectious, protected against insects, and samples thereof forwarded to the laboratory for examination. Blood culture may be necessary to exclude typhoid infection. Agglutination tests of blood sera should be performed in doubtful cases, but not before the 7th day of illness. Botulinus anti-toxic serum should be administered at once to those suffering from botulism—delay is fatal.

A list of all food partaken of by patients during the previous 48 hours should be prepared; samples of these foods should be collected and forwarded, packed round with ice, to the laboratory; tinned or potted material should be forwarded in its container.

Post-mortem examination should be performed if death occurs and a diagnosis has not been made.

The quarantine of contacts or suspects, unless they are engaged in the handling of foodstuffs, should not be enforced.

692. Heat Effects.—1. Heat effects are most liable to occur on a hot, still, muggy day, especially when the atmosphere temperature has been constantly high for several days; and are due either to conditions of general heat or to the direct rays of the sun acting on a person below par. Three main types are recognised :—

(a) *Syncopal type*.—This is accompanied by pale face, very light breathing, little or no fever, feeble pulse and low blood pressure.

(b) *Hyperpyrexial type*.—Here there is headache, frequency of micturition, dry skin, marked rise of temperature (105° Fahrenheit or over), congested face, and later, drowsiness, unconsciousness and snoring.

(c) *Dehydration type*.—In this case there is much sweating and vomiting with low fever (100–101° Fahrenheit) and later, muscle cramps owing chiefly to dehydration and loss of salts.

2. *Prevention*.—Personnel should be informed that the precautions to be taken against heat are simple to observe, and, if conscientiously undertaken, are effective. During the summer months no strenuous exercise or effort should be undertaken in the direct rays of the sun, but moderate exercise is beneficial. Between sunrise and sunset a sun-proof helmet should be worn in the open, also anti-glare glasses (Crookes' B.1. lenses or Infrex No. 1) with side-pieces which effectively shield the eyes from reflected glare. Tight clothing, especially tight collars, should not be worn. The bowels should be kept open daily.

Diet should be light, a heavy meal at mid-day should be particularly avoided. No alcohol should be taken between sunrise and sunset. Less meat and more fruit than is the custom in temperate climates should be eaten. An adequate supply of cool, pure drinking water should be available in all quarters, offices, workshops and for working parties in the open. Tea, orangeade and lemonade are specially recommended as drinks. Salt should be taken with all meals to replace that lost through sweating, and it is advisable to take one day a week on rising a teacupful of cold water to which has been added a teaspoonful each of common salt and baking soda; salted almonds or other nuts are to be recommended.

Electric fans or punkahs should be installed in all quarters, offices and other indoor places where personnel are employed in heat-stroke areas. These fans create air currents which materially aid the cooling of the human body.

3. *Treatment*.—Treatment must be rapid and efficient, as death is liable to take place quickly.

(a) In the syncopal type the patient should be placed in the shade, all clothing should be loosened and he should be given stimulants.

(b) In the hyperpyrexial type the patient should be immediately placed in the shade and all clothing removed. He should be placed on a bare bed frame or charpoi, his whole body sprinkled with the coldest water available and fanned to encourage evaporation, or immersed in water. Meanwhile, two pints of cold water, to which fluid quinine solution equivalent to 20 grains of quinine has been added, should be prepared. This solution, or cold water alone, should be injected into the lower bowel as an enema. The resulting rapid movement of the bowels materially helps to lower the body temperature. After the temperature has been reduced, the patient should be kept at rest in the shade, preferably on a bare bed frame (charpoi) to encourage air cooling. He should be cradled with wet sheets and fanned if the rectal temperature tends to rise again. In the event of an emergency landing in a desert country on account of heat effects, the shade afforded by an aeroplane wing and the cooling effects of the draught from the airscrew should be utilized.

(c) In the dehydration type the body fluids and salts that are lost by vomiting and excessive sweating should be replaced by the liberal administration of bland fluids by the mouth, together with intravenous transfusion of normal saline containing two per cent. sodium bicarbonate.

It is very dangerous for anyone to be exposed to the sun after suffering from heat-stroke ; most cases require to be transferred to the United Kingdom.

693. Influenza.—1. The term "influenza" is very loosely used, and includes usually true influenza which is a virus infection with constitutional symptoms preponderating, and naso-pharyngitis and tonsillitis which are mixed bacterial infections often due to haemolytic streptococci and with respiratory symptoms predominating. Both are debilitating conditions affecting a large number of individuals at one time. The general preventive measures, however, apply equally to both types of infection which are spread by the droplet method.

2. *Carriers.*—Human carriers of the virus of influenza occur even in the interval between epidemics, but they are difficult to find. Carriers of pathogenic haemolytic streptococci are common, 6 to 10 per cent. of the population of this country harbouring them for most of the year, the figures rising to 30 to 40 per cent. during epidemic periods, especially in the early months of the year.

3. *Prevention of infection.*—Epidemics once started are difficult to control; therefore, as "influenza" is liable to occur each winter and in epidemic form at intervals of thirty-three weeks, general precautions should be taken to forestall the onset of both types of this malady.

The general prophylactic measures are the dictates of common sense, and should aim at the prevention of "droplet" infection from the upper respiratory tract. Thus arrangements should be made for everyone to have as much fresh air as possible—extra outdoor games should be organized for all; barrack-rooms and huts should be freely ventilated, especially at night; beds should be spaced out, facing alternately in opposite directions to increase the distance between the heads of individuals; overcrowding in canteens and cinemas should be avoided, and the floors of these places cleaned and disinfected daily with 2½ per cent. cresol solution. Great care should be taken to prevent chills; wet clothing and boots should be changed as early as practicable, and excessive sweating should be avoided or be followed by a rub down with a dry towel.

During an epidemic, airmen should be encouraged to irrigate their naso-pharynxes with a disinfectant solution such as 1 in 5,000 potassium permanganate in normal saline, which is specially valuable in killing off virus. In addition, all feeding utensils should be steeped in boiling water after cleansing. The danger of the disease spreading during close conversation, coughing, sneezing and spitting should be impressed on all persons.

The protection of personnel should be attempted by the judicious administration of an anti-influenza virus vaccine or a mixed anti-catarrh vaccine, preferably given about a month before an epidemic wave is expected; two to three inoculations should be given at weekly intervals. The anti-catarrh vaccine should contain not only the *H. influenzae* but also the commoner organisms responsible for many of the secondary complications; it tends to lessen the severity of the disease (*see* paras. 648 and 649).

Those in attendance on influenza patients should wear gauze face-masks, and carry out naso-pharyngeal disinfection daily.

4. *Isolation*.—All persons suffering from influenza should go to bed at once ; this procedure tends to limit the severity of the disease and its spread to others. During an epidemic certain huts or barrack blocks should be converted into temporary sick quarters where cases of influenza may be isolated. The patients should be well spread apart.

When the type of disease is severe, influenza vaccine or an anti-serum, the variety depending on the particular complicating organism, should be administered at once ; such treatment is frequently beneficial.

Sputum and nasal discharges should be treated as infectious.

The convalescent period of influenza should not be curtailed as there is the danger of incurring serious pulmonary and cardiac complications or sequelæ, including tuberculosis.

694. Leishmaniasis (Oriental Sore and Kala-Azar).—1. This term includes kala-azar, infantile leishmaniasis and cutaneous leishmaniasis (oriental sore). The last named is the commonest type of this disease that is encountered in the Service. The simplest view to adopt for public health purposes is that all forms of leishmaniasis are due to the same parasite, which may be transmitted to man by various biting insects ; passage through these insects may account for the different types of infection. Where investigations tend to inculpate any particular insect vector, special measures should be instituted for its destruction.

2. *Carriers*.—Leishmaniasis in all its forms is a chronic disease, so that man untreated carries the infection for long periods, often over a year. The causal virus of oriental sore is thought to be transmitted from man to man, or dog to man by the agency of sandflies (*Phlebotomus sergenti*) ; whereas that of kala-azar is probably transmitted by the bite of another sandfly (*Phlebotomus argentipes*). The kala-azar parasite is at times excreted in human fæces and even in the urine, and there is some evidence that infection may occur through ingesting contaminated food.

3. *Prevention of Infection*.—In the present state of knowledge this is a wide problem and, as indicated above, should involve the efficient disposal of excreta ; proper protection of food ; protection of man against insect bites, especially those of sandflies ; the removal of all rubbish and organic debris from the proximity of dwellings, for insects breed in filth ; the removal to a safe distance of domestic animals which may act as reservoirs of infection ; and, last but not least, the early detection and isolation of all human carriers of the disease. In this connexion cases of splenic enlargement should be repeatedly examined unless the cause is ascertained.

The measures necessary for the disposal of excreta, and the protection of food are given elsewhere. (See "Cholera," "Dysentery," and "Enterica," paras. 686, 688, 690 respectively.)

Methods for the avoidance and destruction of various biting insects are described under "Malaria," "Phlebotomus Fever," "Plague," "Relapsing Fever," and "Typhus." (See paras. 695, 698, 699, 702, 708.)

When a case of kala-azar occurs in a hot climate, the patient should be isolated, the quarters vacated, disinfested and disinfected. The other inmates should be removed to clean quarters and should not re-occupy the old until sanction is granted by the competent medical authority.

4. *Isolation*.—Cases of kala-azar and infantile leishmaniasis should be isolated, disinfested, and protected by sandfly-proof netting and other means from the ravages of biting insects. All excreta and fomites should be treated as infectious. Patients with oriental sore may be allowed to carry on their ordinary duties, but should have all lesions adequately covered with a dressing, which should be burnt when finished with, to prevent insects from feeding on it and so becoming infected.

No case of kala-azar should be considered cured until at least three consecutive monthly tests, both animal and cultural, have proved to be negative.

All kala-azar contacts should be segregated until clinical and bacteriological examination fails to reveal disease; thereafter they should be examined periodically for several months as the incubation period may be long.

695. Malaria.—1. Although malaria is conveyed to man by anopheline mosquitoes, only certain of these are true vectors of this disease. To carry out anti-malaria work economically in any malarious area, due consideration must be given to the local anophelines, their malaria-carrying power, haunts and habits; anti-mosquito measures should be directed primarily to the commoner malaria carriers. The advice of a malarialogist is necessary in this connexion.

2. *Carriers*.—Human carriers are common in malaria districts; every subject of malarial infection whether he is showing active symptoms of the disease or not, is a possible carrier of the stage of parasite that is capable of infecting an anopheline mosquito when it feeds upon him. Man may carry malaria for years; the mosquito, once infected may remain so for the rest of its life, but the infection is not passed on by heredity to its progeny.

3. *Prevention of Infection.*—In order to carry out an anti-malaria campaign satisfactorily, the whole personnel in malarious areas should understand the rudiments of the infection—that the causal organism depends for its life cycle on the close association of the necessary mosquito and man, and that any process which will separate these two links in the chain of infection will cut short the cycle of development of the malarial parasite and ultimately prevent the occurrence of the disease in man. The general prophylactic measures should aim at—

- (a) Protection of man against mosquito bites.
- (b) Control of human carriers of the disease.
- (c) Control of mosquitoes.

(a) *Protection of Man against Mosquito Bites* is the most important and economical method of preventing malaria. For this purpose, mosquito nets (26 holes to the square inch, woven of 30/s cotton) should be used by all personnel in malarious regions; they should be tucked in before sunset, kept in good repair, and systematically searched daily for rents and tears.

In addition, personal prophylaxis should be attempted by the prohibition of shorts after sundown. A change into slacks or preferably into some form of trouser that will prevent mosquitoes from biting the legs should be made at dusk. This change of clothing also aids in the promotion of good morale as well as of the general cleanliness so important in the heat-stroke season. Wellington boots and overalls should be encouraged for mess wear; they are a protection against insect and snake bites. The wearing of two pairs of socks gives local protection. Cane-bottomed fenestrated seats should be covered with folded paper. Repellants, such as oil of citronella, bamber oil, cassia oil, "vermijelli" or paraffin should be smeared on exposed parts of the body after dark, especially at bed time. Night sentries should be protected in a similar manner.

Electric fans should be used in permanent buildings, and should be so arranged that every part of the room is affected by the air currents derived from their revolutions. As with the sandfly, these fans render it extremely difficult for the mosquito to fly about, and in addition, tend to lessen the occurrence of heat effects.

(b) *Control of Human Carriers of the Disease.*—Every case of malaria or suspected malaria (including P.U.O's and N.Y.D's) should be made to use a mosquito curtain while in bed; they should retire to their mosquito-proof quarters in hospital or special building at sundown and remain there until sunrise. If possible, all malaria cases and convalescents

should be removed for duty to an area free from mosquitoes capable of carrying malaria. Malaria carriers are more frequent among native personnel; in consequence they should be housed well to leeward of European quarters, and energetic treatment should be instituted immediately to rid their peripheral circulation of malaria parasites.

(c) *Control of Mosquitoes.*—This entails considerable expense and labour, but should be carried out as circumstances permit after the foregoing measures have been adopted. An anti-mosquito campaign should be waged for a distance of at least half a mile from the camp by squads supervised by sanitary personnel specially trained in the work. These squads should be formed abroad out of the more intelligent of the native menial personnel.

Waterlogged ground should be drained by the cutting of channels or gutters to carry away the surface water rapidly, as mosquitoes tend to lay their eggs in sluggish or stagnant waters. Drip cans made to discharge about 20 drops of oil a minute should be erected over the centre of the distal end of each of these channels. Channels should not be cut without surveying levels and should be bench-marked so that levels can be kept at subsequent cleanings. For the removal of undesirable collections of sub-soil water, drainage pipes should be laid.

Hollows in the surface of the earth should be filled in, and the ground generally levelled to prevent accumulation of water. Care should be taken to leave no "borrow holes."

All receptacles likely to collect water, such as disused tins, bottles, and jars should be removed. The smallest amount of surface water is a potential breeding place for mosquitoes.

Undesirable collections of surface waters (ditches and ponds) that cannot be removed should be oiled. The process of oiling aims at clogging the "pores" of the mosquito larvæ and pupæ, so it follows that the whole surface of the water should be covered. For running water passing near camps, it is sufficient to oil the more sluggish parts such as water near the banks. The banks of all water-ways should be kept clean cut and as free from weeds and aquatic vegetation as possible to avoid stagnation. The oiling should be repeated weekly with the following mixture—paraffin oil one part, heavy oil two parts. For ditches, the oil should be allowed to drop on the surface of the water (20 drops a minute) from a height of 4 feet to break up the oil. Ponds and large pools should be oiled by adding $\frac{1}{2}$ pint of oil for each 100 square feet of surface and thoroughly mixing with paddles or floats.

Large areas of swamp may be powdered with Paris Green (mixed in the proportion of 1 in 100 with local earth) from

aeroplanes. The same chemical may be dusted also by hand on irrigation ditches and small swampy patches. The mosquito larvæ are poisoned by ingesting the Paris Green.

Water in irrigation channels should be kept moving; in addition, all irrigation ditches should be left dry for at least forty-eight hours once a week, to lessen mosquito breeding.

All cisterns and tanks containing water for drinking and domestic purposes should be efficiently covered with well-fitting lids; they should be frequently inspected, cleaned and kept in good repair.

Ducks or predatory fish (e.g., *Gambusia*) may be introduced into pools to lessen the number of insect inhabitants. All weeds, rushes and useless vegetation should be removed from the camp area to reduce the sheltering places of adult mosquitoes, as well as pests associated with other diseases, e.g., sandflies. Creepers on barrack walls and vegetation on verandahs should be prohibited.

Rooms, tents, cellars, latrines and outhouses should be periodically fumigated with sulphur (3 lb. to 1,000 cubic feet air space), cresol vapour or formalin. Spraying with "Pyrocide 20", 1 per cent. cresol solution or with "Flit" is efficacious in destroying mosquitoes and should be practised daily. The destruction of stupified insects should be completed with swatters. Dark corners of buildings and tents should be searched carefully, as mosquitoes congregate in such places, especially in cold weather; these insects should be killed by swatting. All parts of rooms should be kept as light as possible, including a light under the table at dinner time.

Quinine prophylaxis, so-called, should not be necessary where the above methods of protection have been properly carried out, but when adopted the quinine should be given in soluble form, under supervision, in 5-grain doses daily.

4. *Isolation*.—All malaria patients, suspects, and convalescents should be forced to sleep under a mosquito net as long as they are in a malarial region. No case of this disease should be considered free from infection for at least two years after the last attack or positive blood-finding was recorded.

All cases of pyrexia abroad should have a blood smear examined for the presence of malarial parasites. This rule should be strictly enforced.

5. *Resumption of Flying Duties*.—Flying personnel who contract malaria should not be permitted to resume flying duties as pilot until they have received adequate anti-malaria treatment and have remained free from clinical laboratory evidence of malaria for one month; at the same time, their responses to the physical efficiency tests, as laid down in A.P. 130, must be satisfactory.

Synopsis of Anti-Malaria Measures.

A.—MAN (Intermediate Host).

- | | | |
|---|---|--|
| (a) <i>Protection against Mosquito Bites.</i> | { | Nets (26 meshes to square inch).
Shorts not worn after sunset.
Boots (Wellington type) recommended for mess.
Mosquito boots or buskins.
Two pairs of thin socks.
Headveils, gloves, etc.
Electric fans.
Repellants. |
| | | (b) <i>Control of Human Carriers.</i> |

B.—MOSQUITO (True Host).

- | | | | | | | |
|-----------------------------------|---|----------------------|---|---|---|---|
| (c) <i>Control of Mosquitoes.</i> | { | Ova
Larvæ
Pupæ | { | Confined to water. Relatively stationary. | { | Draining ground.
Filling in hollows.
Removing receptacles likely to collect water.
Lowering of sub-soil water.
Oiling of water.
Dusting with Paris Green.
Protection of drinking water.
Introducing predatory fish.
Clearing vegetation to allow of sunlight.
Traps for egg-laying mosquitoes.
Clearing vegetation. |
| | | | | Imagines |  | { | Migratory and found in houses. | { | Fumigation. Traps. No dark corners. |

696. Measles (and Rubella).—1. Measles is due to a filterable virus and is spread by droplet infection, children and young adults being specially susceptible. The majority of cases occur during the periods April to June or November to January. The disease occurs both in temperate and tropical climates.

Pulmonary complications, due chiefly to the streptococcus, are liable to occur during this disease and should be specially guarded against.

2. *Carriers.*—This infection is spread mainly by naso-pharyngeal carriers of the incubatory type, by missed cases of the disease, and by those in the catarrhal stage. During an outbreak, therefore, all cases of coryza should be isolated for a week as suspects of this disease.

3. *Prevention of Infection.*—At medical inspections, especially of those returning from leave, particular attention should be paid to the occurrence of rashes on the forehead, and coryza ; all such cases should be isolated until the diagnosis of the condition is clear, for measles is a serious malady with a high death and disability rate, especially amongst native personnel.

When a case occurs, the room, clothing, bedding and feeding utensils should be disinfected. All immediate contacts, after thorough disinfection of their clothing, personal effects, and feeding utensils should return to duty, and should be instructed to report to the sick quarters twice daily for a week to carry out naso-pharyngeal disinfection with 1 in 5,000 potassium permanganate solution. They should be medically inspected daily from the 7th to 14th days, and, if any are found to be suffering from malaise or coryza, they should be isolated, preferably in hospital.

Instructions should be issued to all regarding the danger of overcrowding, insufficient ventilation, and chills during outbreaks of this disease.

If it is desired to augment the natural resistance by the use of serum from convalescent cases, due care should be exercised to see that the serum is from a healthy person, *i.e.* tuberculosis and syphilis free. It is simpler and safer to take blood from one of the parents, if possible, as it can be assumed that they have immunity to measles. If serum is used, 5 to 10 c.c. should be injected intramuscularly ; if whole blood is used, 15 to 30 c.c. should be given. This treatment of a non-immune contact should either abort the disease or lead to a modified attack.

4. *Isolation* of measles cases will be maintained for three weeks, or until naso-pharyngeal or ear discharges have ceased ; that of rubella for a week. Great care should be exercised in the final bathing and disinfection of patient and clothing.

Special precautions should be taken during measles and for several months afterwards to avoid the onset of pneumonia and tuberculosis. Officers commanding units should be informed of the danger of employing these men on all-night

guards, long and strenuous route marches, and on any duties which may unduly expose them to inclement weather or draughts for at least six months.

Contacts of measles should not be isolated, but should be medically examined, daily, from the 7th to the 14th days; rubella contacts should be medically examined daily from the 7th to the 21st days for the detection of early signs of disease.

697. Mumps.—Mumps is a droplet infection, which may occur at any age. It is important to enforce strict confinement to bed to help prevent such complications as orchitis, which may lead to sterility.

2. Carriers.—The infection is chiefly spread during the incubation period and throughout the disease by means of particles of moisture derived from the buccal and nasal cavities.

3. Prevention of Infection.—The medical inspection of personnel on joining a unit or on returning from leave should include the examination of the parotid region and testes. When a case of mumps occurs, the room, clothing, bedding and feeding utensils should be disinfected.

Those in attendance on the sick should guard against "droplet" infection; non-immunes should wear gauze masks.

4. Isolation of all cases of mumps will be maintained for at least three weeks. Patients should be confined to bed for 14 days as a safeguard against the development of orchitis.

The quarantine of contacts is not necessary. Contacts should be medically examined daily for four weeks and, during the first week, have their throats painted daily with carbol-glycerine.

698. Phlebotomus or Sandfly Fever.—1. *Phlebotomus* fever is one of the chief causes of inefficiency, due to sickness, in the personnel of the Royal Air Force serving abroad. The seriousness of this disease lies in the fact that whole communities may be affected at the same time. Convalescence is often prolonged and accompanied by considerable nervous debility.

2. Carriers.—Man carries the virus of sandfly fever in his blood for the first two days of fever. *Phlebotomus papatasi* (the sandfly) is the true carrier of the infection; the adult female insect bites usually at night and transmits the disease to man during the warm weather. The virus would appear to survive the winter either free in the soil, or within the bodies of *phlebotomus* larvæ which inhabit such sites as moist soil and porous damp walls. These larvæ become infected by feeding on the dead bodies or excreta of parent flies.

3. *Prevention of Infection.*—The prevention of sandfly fever consists in the extermination or avoidance of the phlebotomus; this should be attempted by the abolition of the breeding grounds of the fly, the destruction of the adult insect, and the protection of man against its bite. These measures should be carried out as a strict routine if success is to be attained.

To abolish the breeding grounds in camps, all rubbish should be burnt; the ground surface should be levelled and rendered as impervious as possible by rolling, tarring, or sprinkling with disused engine oil; buildings, walls, and embankments should be properly faced, pointed, and treated with tar or some coal tar preservative; no gardens or cultivated ground should be permitted in the immediate vicinity of buildings, and creepers should not be allowed on barrack walls, as they afford shelter to various insects; fowls or other animals should not be housed near living quarters. In addition, internal walls, woodwork and ceilings of buildings should be distempered or limewashed yearly at the end of the rainy season.

The adult insect seeks shelter in barrack rooms in dark corners, cupboards, cobwebs, kit and other hangings on the walls. All barrack rooms should be cleansed daily, especially the corners; cobwebs should be removed; and the rooms should be sprayed with "Flit" or "Pyrocid 20"; all hangings should be shaken to dislodge any hiding insects. After such a procedure most of the sandflies congregate in the upper corners of the room, and a special sanitary party armed with suitable ladders and swatters should kill these flies.

To reduce the incidence of sandfly bites certain general measures should be instituted. Shorts should not be worn after sundown. Night sentries should smear the exposed parts of their bodies with bamber oil or "vermijelli." Punkahs and electric fans should be utilized to create air currents which drive off many flying insects. As many sleeping quarters as possible should be upstairs.

Individuals should be encouraged to protect themselves against sandfly bites by the use, where possible, of sandfly-proof nets (45 meshes to the square inch) or of a moistened mosquito-proof net; should smear their wrists and ankles with "vermijelli," oil of citronella, or paraffin; wear slacks and two pairs of socks or Wellington boots after dusk; not loiter about when bathing at night; place a few lumps of camphor in their beds.

4. *Isolation.*—All cases of this fever and suspects should be protected by an efficient sandfly-proof net to prevent extension of infection to non-infected phlebotomi.

The isolation of contacts is not necessary.

699. Plague.—1. Bubonic plague occurs chiefly in warm climates, during or after the rains. The pneumonic type of the disease usually occurs in colder climates, during the winter months, especially in damp confined atmospheres. There is always a certain degree of septicæmia in plague, but some cases are highly septicæmic from the onset. Bubonic plague is spread to man by fleas from infected rodents.

2. *Carriers.*—All types of plague epidemics probably originate from a bubonic case.

(a) *Bubonic plague.*—Many rodents (rats, bats, squirrels) harbour the plague bacillus and are potential sources from which the disease may spread to man. Those rodents which come in closest contact with man and his habitations are chiefly concerned in the spread of the human disease. The plague bacillus is transmitted from rat to man by fleas. As rats desert a sinking ship, so fleas leave their dying host and seek shelter in the first suitable warm-blooded animal. The regurgitated stomach contents or fæces of these insects may contain the plague bacillus, which is inoculated through bites or abrasions of the skin. Fleas may remain infective for six weeks.

Man may carry the infection for three weeks after convalescence is established.

(b) *Pneumonic plague* is spread by droplet infection, and is highly infective.

(c) *Septicæmic plague* may originate from either of the above types.

3. *Prevention of Infection.*—This should consist chiefly in the destruction of rats and fleas, the protection of man against infestation and bites, the early detection of ambulant cases of the disease, and prophylactic inoculation with vaccine or serum. For the destruction of rats, *see* para. 670.

Fleas should be kept out of human habitations or destroyed by means of general cleanliness, disinfectants, and repellants. Floors should be treated daily with 1 per cent. cresol solution, "pesterine" (kerosine 20, soft soap 1, and water 5 parts), or naphthaline powder, then swept and all sweepings burned. Paraffin should be lightly smeared over bedsteads. Bedding and textiles should be exposed for an hour daily to the full force of the sun. Personnel should not sleep on the ground, but on a raised bed, as the maximum height for a flea to jump is 4 inches.

Plague-infected areas, especially native bazaars, should be placed out of bounds. Native personnel should be inspected frequently and freed of vermin.

Free ventilation of all barrack-rooms and tents should be enforced to lessen the chance of pneumonic infection.

Domestic animals and pets should not be permitted in barracks during the plague season.

In plague districts the medical inspection of all cases reporting sick should include an examination of the inguinal, axillary and cervical lymph glands. Suspects should be isolated.

Haffkine's plague vaccine induces considerable immunity to the disease, and should be given about a month before the plague season is due (*see* para. 647). The reaction to subcutaneous inoculation is marked, so that all personnel vaccinated should be granted 48 hours off duty with permission to stay in bed.

Those in attendance on plague patients should receive 20 c.c. of Yersin's anti-plague serum and 1.5 c.c. anti-plague vaccine on the same day; ten days later a 2.0 c.c. dose of vaccine should be given. Attendants should wear lysol-impregnated gowns fastened at wrist, ankles, and neck; rubber gloves and gum boots; and to prevent droplet infection should use close-fitting goggles over their eyes, and gauze face-masks 8-fold thick. They should wash thoroughly before shaving, and their clothes and persons should be disinfected daily.

For the sanitary regulations in connexion with plague and applicable under the International Sanitary Convention for Aerial Navigation, *see* A.P. 1269A.

4. *Isolation.*—When a case of plague occurs it will be isolated immediately, the building vacated, and the inmates treated as contacts and segregated in clean temporary quarters. The infected building and all its contents, including clothing and personal effects, will be disinfested and disinfected. This should be attained by soaking the floor with "pesterine," then fumigating with sulphur dioxide, and leaving this to act for 24 hours. Personnel carrying out these duties should be protected with gum boots, gauntlet gloves, and special overalls. Further treatment with "pesterine" should be carried out the following day. Clothing and bedding should be sterilised by steam. Old bedding should be burnt. If the building concerned is a native quarter, the floor should be carefully fired by igniting a thin layer of straw carefully spread over it. Old defective quarters are best treated by completely burning them out. Sputum, urine, faeces, purulent discharges and fomites of patients suffering from plague should be treated as infectious. Feeding utensils should be boiled after use. Isolation should be maintained for a month after convalescence is established.

Buboes of a doubtful nature will be subjected to bacteriological examination, the patient being isolated until the result of the examination is known.

Contacts should be thoroughly disinfested and disinfected, segregated, and medically examined daily for six days. They should be given anti-plague vaccine and serum, if vaccine treatment has not been given previously.

700. Pneumonia.—1. Pneumonia may be due to a variety of causes—pneumococcus, pneumobacillus, streptococcus, tubercle bacillus, the bacilli of influenza and typhoid, plague bacillus, spirochaeta of relapsing fever, brucella of undulant fever and the protozoa associated with malaria and leishmaniasis; therefore great care should be exercised in making a diagnosis of the cause of pneumonia.

It is especially important that when an outbreak of pneumonia occurs, investigations should be commenced at once to ascertain the causal organism, so that appropriate preventive and therapeutic measures may be instituted to prevent the outbreak assuming an epidemic character.

2. *Carriers.*—These are mainly of the respiratory type, so that naso-pharyngeal swabbings of contacts and suspects should be examined. In the case of the pneumococcus the type should be reported on, as Type IV carriers may be considered relatively innocuous.

3. *Prevention of Infection.*—Careful attention should always be paid to the provision of efficient floor space per man, and to the proper ventilation of barracks and other buildings to avoid droplet infection, especially during the colder months when overcrowding and respiratory diseases are common. Personnel should be warmly clad, should be encouraged to keep their feet warm and dry, and to change their undergarments after strenuous exercise. Oral cleanliness and toothbrush drill should be enforced. Spitting should be prohibited. All cases of pneumonia, and all contacts during severe epidemics, should be isolated (*see* under "Influenza", para. 693, clause 3). Attendants on pneumonia cases should wear gauze face-masks, and should receive preventive inoculation against the disease, if practicable.

Prophylactic vaccination with anti-pneumococcus vaccine may be given in the autumn to specially susceptible persons, and, when epidemics threaten, to all.

4. *Isolation.*—All cases of pneumonia should be isolated, especially when dealing with the native races in whom the disease is apt to spread rapidly and to be fatal. Fomites, feeding utensils, sputum and nasal discharges should be treated as infectious. The causal organisms should be searched for in the sputum and in blood culture.

The isolation of contacts should not be required, except in severe epidemics when special buildings should be set

apart for this purpose. Carriers of virulent strains of organisms should be segregated and subjected to naso-pharyngeal disinfection until pronounced free from infection.

701. Rabies.—1. The virus of rabies is carried by canine and feline animals, chiefly dogs and jackals. The disease is transmitted to man by the bite of a rabid beast, and it should be remembered that though the animal may appear normal at the time of biting, yet the virus may be present in its saliva for a week prior to the onset of definite symptoms. Incubation period varies from two weeks to three or more months; this allows sufficient time to give preventive treatment.

2. *Carriers.*—Chiefly canine and feline tribes; the saliva of man with rabies is infective.

3. *Prevention of Infection.*—In districts where rabies is known to occur, personnel should be warned against interfering in any way with strange dogs. Stray dogs should not be allowed in the camp; any found should be destroyed or locked up until handed over to the civil police.

No dogs should be kept in the camp without a written permit from the C.O. All dogs should wear a collar labelled with the name of the owner. Owners should be warned that if a dog shows signs of distinct alteration in its behaviour, the fact should be reported to the C.O. The dog should be examined by a veterinary surgeon, and kept under observation for ten days.

When rabies is prevalent, all dogs should be muzzled and kept on a lead.

Personnel should be warned that all bites and scratches received from animals should be reported as soon as possible to the medical officer. The wound should be sucked immediately (the gastric juice destroys the virus of rabies), made to bleed, well cleansed with soap and water, thoroughly cauterised with pure phenol, lysol or the crystals of potassium permanganate, and finally flushed out with clean water. Every wound and every part of each wound should be thoroughly treated. A tourniquet should be applied above the site of the bite in a limb for a period not exceeding fifteen minutes.

The animal responsible for the bite should be secured, if possible, and handed over to the medical authorities for observation. If the animal has been killed, its whole body or head should be wrapped in a clean towel, packed in ice, and forwarded at once to the pathological laboratory. Transport should be by air where necessary. The further treatment of the case should be guided by the pathological or veterinary report.

The medical officer attending the case should secure and forward in duplicate to the competent medical authority concerned the following particulars :—

- (a) name, rank, age, and unit of person bitten ;
- (b) time and date when bitten ;
- (c) locality where injury occurred ;
- (d) part of body bitten and whether through clothing ;
- (e) number of bites received and their severity ;
- (f) kind of animal causing bite ;
- (g) whether animal was captured and what action has been taken regarding it ;
- (h) whether rabies has been diagnosed in the animal and by whom ;
- (i) name and address of owner of animal, or other information which will enable the animal to be identified.

Specific anti-rabic treatment should be given where the animal is strongly suspected or proved to be rabid, where the beast is unknown and has escaped, and in cases where the wounds are deep, multiple, or involve the head, face, or neck. This treatment should be commenced early, for the necessary course of vaccine occupies 15 days, and because the incubation period for the disease following on face injuries may be as short as three weeks.

The Director-General of Medical Services in home commands, and the competent medical authority in commands abroad should be notified by signal of all cases requiring specific anti-rabic treatment.

4. *Isolation*.—Patients suffering from rabies should be isolated, and treated with atropine and anti-rabic specific vaccine.

Attendants should protect their skin against contamination by the saliva of the patient.

The quarantine of rabies-suspected animals, that may or may not have bitten man or other animals, should be maintained for at least ten days—symptoms of rabies, if present, should be in evidence before the end of this time.

702. Relapsing Fever.—1. There are several varieties of relapsing fever—European, Indian, Egyptian, American, Persian, and Central African—but for practical purposes these may be separated into two classes, louse-borne and tick-borne.

2. *Carriers*.—Man has not been shown to carry the causative organisms (*Spironema recurrentis* and other species) after the termination of the disease, but infected lice and ticks appear to remain infective for the rest of their lives.

3. *Prevention of Infection.*—Preventive measures should aim at the avoidance and destruction of lice, ticks and all biting parasites.

Anti-lice campaigns should be carried on as described under the prevention of typhus (*see* para. 708, clause 3) ; body and head lice are both concerned.

In tick-infected areas, all buildings and quarters used by natives should be avoided and frequently disinfected. Natives should not be allowed to sleep in the same quarters as Europeans. Beds and sleeping apartments of all personnel should be inspected daily for ticks and other vermin, and the bedding exposed to the sun. Pyrethrum or Keating's powder may be dusted in the bedding. Personnel should not sleep on the ground, and should use a mosquito net at night. Bed-legs should be rendered smooth. Bedsteads should be smeared frequently with paraffin. The floors of all buildings should be kept clean and sprinkled daily with crude cresol in water. Where possible the walls of huts and side curtains of tents should be 8 to 10 inches clear of the ground to prevent ticks and bed bugs climbing up the sides—they delight in dropping on their victims. Tent poles and guy ropes should be provided with guard cups facing downwards and well smeared internally with grease or carbolised vaseline. These cups can be improvised out of small tins ; they should be inspected daily, and any ticks or insects found therein removed and destroyed. Similar cups should be fitted to all legs of beds and tables. Any gap between neck of a cup and its support should be closed up with grease. Trenches with perpendicular sides, about six inches wide and nine inches deep, should be made around all buildings ; the bottom of the trench should contain wood ash, and should be sprinkled with crude cresol or paraffin weekly to kill off any trapped ticks. The site of temporary camps should be well away from the beaten track, and when possible should be fired. Living quarters should be fumigated frequently with sulphur, pyrethrum or "Pyrocide 20". Daily ablution, inunction and the wearing of lysol-treated undervest or shirt should be encouraged (*see* under "Typhus" para. 708, clause 3).

4. *Isolation.*—Relapsing fever patients will be isolated until disinfested, and protected against further bites from ticks and lice by a mosquito net or other means for at least a fortnight after the temperature has returned to normal, and blood examination has proved negative to parasites. The blood, sweat, saliva, urine and fomites should be considered infectious. Novarsenobillon (0.6 gramme) should be given intravenously for curative purposes ; this drug rapidly renders the patient non-infectious in most instances.

Nursing attendants should take great care to avoid infection by the human body fluids and by vermin off the patients (see under "Typhus" para. 708, clause 4).

The isolation of all verminous persons should be enforced for 10 days; their bodies, clothing, quarters and effects should be disinfested and disinfected.

703. Scarlet Fever.—1. Scarlet fever is due to various types of hæmolytic streptococci, which are spread chiefly by droplet infection, by personal effects, especially pencils and pens, and by milk. Missed cases, *e.g.*, tonsillitis or sore throat without a rash, are potent sources of infection, but are apt to be treated as minor ailments, and thus are liable to develop otitis media or nephritis at a later date.

2. *Carriers* should be looked for, especially among those handling milk supplies. Dairymen, cookhouse and canteen personnel should have their hands examined during routine inspections for signs of desquamation. Tonsillitis and otitis cases should have swabbings from their throats searched for the presence of *Streptococcus hæmolyticus scarlatinae*, and typed where necessary.

3. *Prevention of Infection.*—At routine medical inspections of men, carried out on returning from leave or on joining the station, special attention should be paid to the inter-digital clefts for evidence of peeling.

When a case of scarlet fever occurs, the room, bedding, clothing and feeding utensils should be disinfected.

(a) In a unit where the majority of the personnel have been Dick tested and immunised, if necessary, there is no need to take any action other than medically to examine the direct contacts, and to see that they irrigate their naso-pharynges with a 1-5,000 solution of potassium permanganate in saline, daily, for a week.

(b) In units where most of the personnel have not been Dick tested or protected against scarlet fever, the Dick test should be applied to the contacts to detect the immunes and non-immunes to this disease (see paras. 645 and 649). The immunes should be discharged to duty. The non-immunes should be given immediate, but temporary, protection by means of hæmolytic streptococcus anti-toxin, or more lasting immunity by means of scarlet fever prophylactic, as detailed in para. 645, clauses 5 and 6. All these contacts should be medically examined and should practise naso-pharyngeal irrigation, daily for a week, as under (a).

At the medical examination of contacts special attention should be paid to the skin on the front of the chest, and to the condition of the tongue, tonsils and naso-pharynx.

During an epidemic of scarlet fever, all persons suffering from sore throat or malaise should be ordered to report sick. They should be isolated for three days and dealt with in a manner similar to that applied to contacts.

All milk should be pasteurised or boiled during an outbreak, dairies should be inspected, and samples of milk collected for bacteriological examination for streptococcus hæmolyticus and its type, if present. All feeding utensils in messes and canteens should be steeped in boiling water after use.

All attendants on scarlet fever cases should be immune to the disease. They should wear overalls and gauze face-masks, disinfect their hands and naso-pharynges after attending the patients and before going off duty.

4. *Isolation* of all cases of scarlet fever and suspects will be immediate and complete. To make a diagnosis in doubtful cases the Dick and Schultz-Charlton tests should be carried out.

Patients should be given 10 to 20 c.c. of hæmolytic streptococcus anti-toxin (concentrated) subcutaneously or intramuscularly as soon as the diagnosis is made; this lessens the severity and duration of the disease. Sulphanilamide may be given by mouth instead of the anti-toxin.

All excreta, discharges, fomites and feeding utensils should be treated as infectious.

No scarlet fever patient should be discharged from hospital as free from infection until desquamation and all nasal and aural discharges have ceased, and the throat is clear of streptococcus scarlatinæ.

704. Small-pox.—1. Small-pox is highly contagious, especially to the unvaccinated (about 30 per cent. of recruits are unvaccinated on joining nowadays). The disease is more virulent abroad (variola major) than in the United Kingdom (variola minor chiefly). No matter whether the diagnosis made is that of small-pox, amaas, alastrim or chicken-pox, the preventive measures should be on the lines of those adopted for true small-pox (see K.R. & A.C.I., para. 1418, clause 7). When small-pox is prevalent, all persons suffering from fever should be isolated for five days to observe the occurrence of any eruptions.

2. *Carriers.*—Man carries the infection until all epithelial eruption and desquamation has ceased, that is, for about four weeks after the first symptoms of the disease. The infection, which is extremely virulent, is spread usually by contact with missed, mild, or abortive cases, and with contaminated materials such as clothing, bedding, rags and personal effects. Biting parasites, for instance lice and bed-bugs, may convey the infection from the sick to the healthy. Winds may carry the infected skin scales for considerable distances.

3. *Prevention of Infection.*—At the medical inspection of personnel returning from leave, attention should be directed to the forehead, back of wrists, dorsum of body, and extensor aspects of limbs, for signs of papules, vesicles, pustules, or scales. All suspects should be isolated, especially men who have returned from areas known to be infected with small-pox.

The vaccination state of the station should be kept up to date at all times, as vaccination with glycerinated calf lymph gives great protection against small-pox. All personnel should be re-vaccinated at five-yearly periods and, in times of epidemics, if not successfully within two years. No statement regarding the date of vaccination should be accepted, unless there is official documentary evidence of the fact. For details of the procedure of vaccination, see paras. 630 to 636.

Close touch should be kept with civil health authorities, and all known small-pox areas should be placed out of bounds.

When a case of small-pox occurs, the building should be placed out of bounds and a sentry mounted on duty at the door. The case should be removed to isolation, and all contacts segregated, re-vaccinated and medically examined daily. All bedding, clothing and personal effects should be thoroughly disinfected, while the building should be fumigated with sulphur dioxide and cleansed out with cresol-treated water. Every corner should be gone into thoroughly. All personnel should be confined to camp, and no strangers permitted to enter it without a special permit. Camp laundries and their personnel should be inspected, and great care should be exercised in the disposal and washing of all clothes. All transport should be disinfected daily. Cinemas should be closed. Barbers' establishments should be supervised.

For the sanitary regulations applicable in accordance with the International Sanitary Conventions for Aerial Navigation, see A.P. 1269A.

4. *Isolation.*—All cases of supposed small-pox, chicken-pox or other vesicular eruption should be isolated immediately, their previous medical history and movements carefully inquired into, and treated as small-pox suspects until proved to be otherwise.

Those suffering from small-pox should be housed in the nearest civil small-pox hospital, but failing that, in some building, or tent situated at least $\frac{1}{2}$ mile to leeward of any habitation, and nobody, except those in attendance on the case, should be allowed to come within this $\frac{1}{2}$ mile radius. Temporary structures are useful for this purpose as they may be destroyed when finished with.

All discharges, skin particles and fomites should be treated as infectious. The patient's skin should be anointed with vaseline or some antiseptic ointment, or treated with 5 per cent.

potassium permanganate solution. No case should be discharged from hospital until all desquamation has ceased for a week. Patient, fomites, effects and room should be thoroughly disinfected prior to discharge.

Attendants on small-pox cases should be chosen from amongst those who have been vaccinated within the previous two years; they should wear gauze face-masks, gowns and rubber gloves, and should be isolated completely from the rest of the community while engaged in these duties.

Contacts and suspects should be isolated for sixteen days unless successfully vaccinated when, after thorough disinfection, they may be released to duty; they should, however, be medically examined daily for sixteen days.

705. Tetanus.—1. Tetanus is liable to occur whenever a wound is contaminated with manured soil; a pin-prick is sufficient to harbour the spores of the tetanus bacillus (*Clostridium tetani*), and wounds that contain foreign bodies, damaged tissues, septic organisms, or blood clots are specially favourable to the development of this organism, which proliferates and remains localised while its toxins ascend to the central nervous system by way of the sheaths of motor neurones.

2. *Carriers.*—*Bacillus tetani* is a frequent inhabitant of the intestines of horses and cattle, and through their faeces infects the soil. At times man carries this organism in his intestine, and tetanus has occurred after abdominal operations in this type of carrier. Biting insects, such as stable flies, may convey the infection.

3. *Prevention of Infection.*—Personnel should be repeatedly warned of the dangers associated with all wounds and bites, and given active protection by means of tetanus toxoid (two doses of 1 c.c. at a six-weeks' interval).

All soil-contaminated wounds, however trivial, should be treated as potentially tetanic. All cases of injury in which the skin is broken, arising out of road accidents, field games, flying accidents or during salvage work, should be given a prophylactic dose of anti-tetanus serum, as in these accidents there is always a potential risk of tetanus infection. The wound should be thoroughly cleansed, irrigated with hydrogen peroxide, and dressed with some antiseptic to remove or kill any contained organisms. At the same time 3,000 units of tetanus anti-serum should be injected intramuscularly or subcutaneously to neutralise any toxin, due precautions being taken as regards desensitisation; this dose should be repeated at the end of a week and, in very dirty or badly contused wounds, two further doses should be given at weekly intervals.

When foreign bodies or compound fractures are being operated on after the original wounds have healed, a prophylactic dose of tetanus anti-serum should be given intramuscularly just proximal to the proposed site of operation, as spores may remain latent until a further wound is made.

All cases of trench foot and severe burns should receive this prophylactic treatment.

Everyone should be encouraged to cleanse and apply iodine to all scratches and insect bites. The more severe wounds should be treated as detailed above.

706. Trench Fever.—1. Trench fever, like typhus and relapsing fever, is liable to occur whenever troops become verminous. The notes on this disease should be read in conjunction with those on typhus fever.

2. *Carriers.*—Man, once infected with this fever, may remain infective for more than a year. The virus (*Rickettsia quintana*) may be present in blood, urine, and sputum of a trench-fever case, and may be transmitted to the louse (*Pediculus humanus*) when it feeds on infected persons. The louse is the common means of spreading the disease from man to man, chiefly through its excreta being scratched or rubbed into abrasions of the skin.

3. *Prevention of Infection.*—All personnel should be taught to cultivate a healthy skin—free from abrasions, impetigo, and scabies—by means of frequent lavage, and a change of underclothing at least once a week.

Any persons found verminous at weekly inspections should be disinfested, and their clothing and effects disinfected.

All clothing and bedding should be disinfected before handing into store. Personnel employed in disinfection and in clothing stores should wear gloves to protect their hands from infection through abrasions.

During outbreaks of the disease, the close approximation and parading of men together should be avoided until they have all been disinfected.

4. *Isolation.*—All cases of trench fever and suspects (including verminous persons) should be isolated, and their person, bedding, clothing, and effects disinfested and disinfected. Their sputum, excreta and fomites should be treated as infective. Their bodies should be smeared with some oily disinfectant preparation to counteract the activities of any stray lice. Further disinfection of patient, bedding, and clothing should be carried out prior to discharge from hospital. These cases, after discharge, should be inspected frequently for vermin, as they are liable to carry the infection in their blood for several months.

707. Tuberculosis.—1. Tuberculosis is most likely to be spread among personnel by droplet infection from the respiratory passages, especially among those employed in confined spaces, for example in offices and aboard aircraft carriers. Its spread is favoured by overcrowding, defective ventilation, poor nutrition, damp and lack of sunlight. Milk containing the bovine tubercle bacillus may cause infection of adolescents under training, leading usually to localised tuberculosis of the lymphatic glands.

2. *Carriers.*—Every effort should be made to detect human carriers and early cases of tuberculosis without arousing the suspicions of the individuals concerned. About 10 per cent. of cows are tuberculous and, therefore, a constant watch should be kept on the milk supply, which should be pasteurised. Cats frequently suffer from tuberculosis, and should not be allowed in sick quarters.

3. *Prevention of Infection.*—Promiscuous spitting should be prohibited. Barracks and workshops should be efficiently ventilated, and kept clean. Floors and furniture should be scrubbed or mopped out with water, to which has been added some disinfectant, such as crude cresol; thereafter the rooms should be thoroughly dried before re-occupation. This should be done daily, except in very damp weather. The floors should never be dry-scrubbed.

On board troopships and aircraft carriers, where the sleeping space below decks is limited, personnel should be made to spend as much time as possible on deck. The between-decks should be wet-scrubbed, and portholes and ventilators should be used to their utmost. Electric fans or punkah louvres should be provided for warm climates.

All milk should be pasteurised or boiled before use, and periodic inspection should be carried out of the concerned dairies, farms, and those working in them. At least once a year samples of milk should be sent for bacteriological analysis.

Early symptoms of tuberculosis should be looked for constantly at medical inspections and sick-parades. All cases suffering from alteration of voice (hoarseness), undue lassitude, continued loss of weight, chronic cough, pleurisy, night sweats, or fever without apparent cause, should be carefully examined for tuberculosis (*see* K.R. & A.C.I., para. 1452). Doubtful cases should be sent to hospital for thorough clinical overhaul and X-ray examination. Sputum, when available, should be forwarded to the laboratory.

Those who have recently suffered from certain diseases which are thought to predispose the patient to tuberculosis should be excused the more arduous duties (*see* under "Measles," para. 696, clause 4, and "Whooping Cough," para. 712, clause 4).

4. *Isolation*.—Those suffering from tuberculosis and suspects should be admitted to hospital and isolated; the respiratory type separated from the others, and each case kept well apart from his neighbour. They should be housed in a sheltered, sunny spot in a dry, airy building. Patients should be kept in the fresh air as much as possible, and exposure to the direct rays of the sun regulated so as to be beneficial and not harmful. All discharges should be treated as infectious. Specimens of sputum, fæces and urine should be forwarded to the laboratory for examination for the tubercle bacillus.

The isolation of suspects should be continued until extensive clinical, bacteriological and radiographic examinations have failed to reveal the presence of tuberculosis. These cases should not be employed in cookhouses, canteens or offices.

708. *Typhus*.—1. For practical purposes there are two main types of typhus:—*Epidemic*, which is common in temperate climes, is highly infectious, and is spread by lice; this includes Brill's disease and tarbadillo, and *Tropical*, which is of low infectivity, appears to be spread by ticks and mites, and is the form of the disease seen usually in warm climates; examples of this type are Rocky Mountain fever, Himalayan and Malayan typhus, and the so-called "mouse," "wheat" and "sugar" diseases (Mossman fever) of Australia.

Every outbreak of typhus-like fever, irrespective of the actual type, should be treated on the lines of the more severe infection.

2. *Carriers*.—It should be remembered that man carries the virus of typhus (*Rickettsia prowazeki*) so long as he has the disease; that lice (*P. humanus*) become infected by feeding on the blood of typhus cases, and remain infective for the rest of their lives; that the tick and mite bearers of the disease are similarly infected, and probably hand on the infection to their progeny; and finally, rodents and domestic animals appear to act as reservoirs for this virus. Thus preventive measures should aim at severing the various links of this etiological chain.

3. *Prevention of Infection*.—At all times there should be a continued and vigorous campaign against lice and other biting insects. General and personal cleanliness should be insisted on to prevent personnel from becoming verminous—cleanliness should go deeper than the buttons. There should be a weekly inspection to detect vermin and infectious diseases, after which every man should be made to bath, and then change into clean underclothes. Bedding and personal effects should be also examined for vermin. Anyone found to be verminous should be isolated immediately; his clothing and bedding disinfected by hot air or steam; his person disinfested

by cutting or shaving all hairy parts and by supervised bathing, aided by the use of 1 per cent. lysol, Jeyes' fluid, paraffin and diluted vinegar—all hairs removed should be burned. Floors should be scrubbed daily and lightly smeared with a paraffin rag or sprinkled with cresol solution.

In tick or mite infected areas the ground in and around the camp should be fired, when practicable. (For other measures, *see* under "Relapsing Fever," para. 702, clause 3.)

The dwellings of natives and all animals should be kept as far away as possible from European living quarters. Typhus endemic areas should be placed out of bounds.

War should be waged on rats and other rodents as described under "Rats," para. 670.

When a case of typhus occurs, the whole camp should be disinfected, including stores; if possible the camp should be moved to clean ground.

In verminous districts and in typhus epidemics everyone should bath daily, and lather his body thoroughly with soap; all hair should be kept short. A clean cotton undervest, previously soaked in $2\frac{1}{2}$ per cent. lysol solution and dried, should be donned after the ablution. All clothes should be carefully examined for lice and dusted with some insecticide, or better, the seams should be hot-ironed before re-dressing.

Those in attendance on the sick should wear overalls, close fitting at the neck, wrists, and ankles, and a skull cap; these should be lysol-impregnated as described. In addition, gum boots and rubber gloves should be worn. When duty is finished, all clothes should be removed, searched for lice, and disinfected; fresh clothes should be put on.

The question of prophylactic inoculations requires specialist's opinion and should not be performed without the written sanction of the competent medical authority.

For sanitary regulations for typhus applicable in accordance with The International Sanitary Convention for Aerial Navigation, *see* A.P. 1269A.

4. Isolation.—All cases of typhus and suspects will be isolated at once, and their clothing, bedding and person disinfested as described above; thereafter, their bodies should be anointed with yellow oxide of mercury ointment, carbolized vaseline or olive oil. Disinfestation should be continued daily throughout the disease. Isolation should be for at least six weeks.

The quarantine of contacts of epidemic typhus should extend after disinfestation to fourteen days, during which time the most scrupulous cleanliness should be practised by all. All contacts should be medically inspected daily.

709. Undulant, Mediterranean, or Malta Fever.—1. Recent observations tend to show that the causal organism of undulant fever and the *Brucella abortus* of cattle are variants of the same organism, and, for the purposes of preventive medicine, this is the view that should be held.

2. *Carriers.*—Human carriers of this disease are usually of the urinary type, and should be searched for when those engaged in handling food are being examined bacteriologically (see A.P. 1269A). Goats, cows, and other domestic animals carry the disease, especially in the Mediterranean area and Middle East; they excrete the causal organism in their milk and so pass on the infection to man.

3. *Prevention of Infection.*—Undulant fever may be spread by food, fingers, flies, and sexual intercourse, so that preventive measures should be directed against these routes of infection.

In endemic or suspicious areas, goats' milk and its products should be prohibited as articles of food. All milk should be sterilized by pasteurisation or boiling before use, or tinned milk should be substituted.

All personnel should be warned as to the danger of partaking of milk and milk-containing foods in hotels, cafes and bazaars.

Cookhouses and canteens should be inspected daily, and special precautions taken with regard to the cleansing of the hands of employees (see A.P. 1269A).

All kitchens, larders, and latrines should be fly-proof. All food on mess tables should be protected against insects.

All personnel should be informed of the dangers associated with promiscuous intercourse.

The dust nuisance should be dealt with by watering or tar-spraying, where possible.

4. *Isolation* of cases and carriers of this fever should be continued until repeated bacteriological examination of urine and faeces shows the absence of the specific brucella—usually six to twelve months. Even then these men should not be permitted to touch general food supplies for another year. Fomites, feeding utensils, excreta, and hands should be disinfected as for a case of enteric fever. Clinical diagnosis should be confirmed by blood and urine culture, and by agglutination tests.

The quarantine of contacts is not necessary, but they should be kept under medical observation for three weeks.

710. Venereal Diseases.—The greatest care should be taken in the early diagnosis and efficient treatment of venereal diseases, for their after-effects are far-reaching. Every effort should be made to gain the personal and professional confidence of all officers and airmen, so that they will come

readily for advice on all subjects of health. Pilots should not be permitted to fly an aircraft on the day of an intravenous injection, moreover they should not be graded higher than A4B during their first course of treatment; subsequent categorization will depend on their general physical fitness.

2. *Carriers*.—The causal organisms of gonorrhoea, syphilis and soft sore are obligatory parasites, so that the majority of infections take place by direct contact with an infectious person, although indirect infection from feeding utensils, kissing, towels and latrines is possible.

3. *Prevention of Infection*.—When airmen are joining the unit or returning off leave, the medical officer should pay particular attention to the external genitals for evidence of venereal disease, including pediculosis.

Healthy sports, outdoor and indoor, should be organized for everyone; especially games of a competitive nature that will absorb the interest of the men. Cinematograph theatres, concert parties and popular lectures should be encouraged for a similar reason. Talks should be given frequently to the men on the dangers of promiscuous intercourse and the best methods of attempting to prevent infection. There should be a daily ablution of the external genitals with soap and water.

Feeding utensils should always be thoroughly cleansed after use to prevent extra-genital chancres and other infectious diseases. Latrine seats should be kept clean, and washed with soap and water daily. Barbers' establishments should be inspected frequently to ascertain that all shaving brushes, razors, etc., are steeped in disinfectant after use.

When cases of infection occur, endeavour should be made to prevent others from getting infected from the same source.

Cooks and butchers, who contract venereal disease, will be removed from these duties at once. If, after discharge from hospital, it is not possible for the Medical Officer to certify that the airmen are free from infection, they will be remustered to aircrafthands (Group V) until such time as they are certified as non-infectious, after appropriate clinical and pathological examination. Such remustering will be considered as "exceptional" (under K.R. & A.C.I., para. 504 (8)).

Aircrafthands (Group V) employed as batmen, mess waiters, mess orderlies or on similar duties, who contract venereal disease, should be removed from these duties immediately. At the same time, a notation should be made on their trade index-cards (Form 678) stating that they should not be re-employed on such duties during the remainder of their service.

Messing N.C.O's, who contract venereal disease, should be removed from duty at once for treatment, but they may be re-employed in their trade after being certified medically as non-infectious.

Prophylactic outfits (tubules of 33 per cent. calomel cream) should be made available for all. Stocks of these should be stored in the sick quarters, and men that draw them should be made conversant with their mode of use.

Early treatment rooms should be situated near the sick quarters or at the entrance to the camp, and should be inspected daily to see that all apparatus is in order.

4. *Isolation.*—All suspects and cases of venereal disease should be isolated immediately, and remain in isolation until free from active infection. Gonorrhœa cases should be considered infectious so long as gonococci can be detected in urethral discharge or prostatic secretion. Syphilitics, who are free from open lesions and who have had at least eight consecutive weekly intravenous injections of some preparation such as novarsenobillon, should be able to return to light duty in their unit provided that they report regularly to the sick quarters or some convenient V.D. centre for the completion of treatment. Since incomplete treatment of this disease often leads to neuro-syphilis, every case of syphilis should be given a full course of treatment, even if the Wassermann reaction remains persistently negative and all symptoms of the disease rapidly disappear. For synopsis of treatment see A.P. 1269A.

All suspected chancres, hard or soft, should be subjected to a definite routine of examination before pronounced as non-syphilitic. The sore should be well cleansed with saline, and, with a capillary tube, some serum should be collected from below the surface of the ulcer. If this should prove negative to *Treponema pallidum*, further specimens should be collected on the two following days. If still negative, gland puncture should be carried out on any enlarged inguinal or other superficial lymph gland to search for parasites. At the end of a week blood should be withdrawn for the Wassermann test, and 0.45 grm. N.A.B. injected intravenously as a provocative dose. A week later a further blood sample should be submitted to the Wassermann test. Cases that still show a negative reaction should have their blood examined once a month for three months and then quarterly for a year before being declared free from infection.

In every case of venereal disease (syphilis, soft sore, frenal ulcer, warts, gonorrhœa, non-gonococcal venereal urethritis, lymphogranuloma inguinale and ulcerating granuloma of the pudenda) blood serum should be submitted for Wassermann, Meinicke or Kahn test six weeks after the case first comes under

observation, independent of any tests carried out at a previous date. The results of all such tests will be duly recorded on Form 478. This action is necessary in order to minimise the risk of syphilis not being diagnosed in cases of dual pathology.

When patients have undergone treatment in hospital for venereal disease and have returned to their units for duty, further specimens, such as blood for Wassermann or Meinicke reactions in syphilitic cases, and prostatic smears in cases of gonorrhoea, are required from time to time as notified. Such specimens *will be collected by the unit medical officer* and forwarded to the appropriate laboratory for examination. Only in exceptional circumstances will the patient be sent to the laboratory when the collection of specimens merely is required.

The urine and all discharges of venereal cases should be treated as infectious. Separate latrines should be provided and clearly labelled for the various diseases—syphilis, gonorrhoea, and soft sore; patients should be instructed to make a paper seat for the latrine, or better still, they should squat but not sit down. Slipper baths should not be used except for therapeutic purposes, then they should be disinfected immediately after use by each case; shower baths should be provided instead. All latrine seats and door handles in the venereal disease block should be disinfected frequently during the day with cresol solution.

Bedding, clothing, towels and feeding utensils of venereal disease patients should be clearly marked with the letter "V" and kept solely for their use (*see* para. 664 and A.P. 830, Vol. I, Chapter II, paras. 101 and 102). Patients should wash their own utensils and keep them in their bedside locker.

Every patient should be given written instructions regarding the general management of his disease, i.e., Form 1572 for those suffering from syphilis, and Form 1573 for those suffering from gonorrhoea.

Venereal patients should have their minds and hands adequately occupied, otherwise their attention is focussed unduly on the diseased part of their anatomy.

Specimens sent to the laboratory from these cases should be accompanied by Form 3212 fully filled in as indicated in paras. 721, 730, 734 and 740.

Particulars relating to venereal patients, written and oral, will be treated as confidential. All information regarding any case transferred from one unit to another will be transmitted through the competent medical authorities and M.Os. concerned.

Venereal disease case cards (Form 478) will be completed as laid down in para. 274.

711. Weil's Disease or Leptospirosis Icterohaemorrhagica.—

1. Rats appear to be the natural carriers of the germ of this disease, which they evacuate in their faeces and urine. A similar organism (*leptospira*) has been found in tap water, in the slime of the roofs of certain mines, in sewers, canals and pools, at home and abroad. Man becomes infected through contact of his skin or mucosa with water or food that has been contaminated by rat excreta containing the specific leptospira. Most Service cases have been contracted when bathing.

2. *Carriers.*—In man the leptospira may be found in the blood, urine, sputum and cerebro-spinal fluid, and the organism may be disseminated by means of sputum or urine for a month or more.

3. *Prevention of Infection.*—Food should be protected against contamination by rats and other animals. A constant war should be waged against rats (*see* para. 670). All cases of jaundice should have their blood sera, collected after the seventh day of illness, sent to the laboratory for the possible detection of leptospira agglutinins.

During epidemics of this disease, prophylactic inoculation with Noguchi's vaccine might be tried.

4. *Isolation.*—Patients suffering from Weil's disease should be isolated, and their excreta and fomites treated as infectious. Their urine should be certified free from leptospira (after guinea-pig inoculation) before discharge from hospital; it is important that the urine should be alkaline if leptospira are to be looked for. These cases should not be employed in handling food supplies for at least six months after discharge from hospital.

In every case of jaundice the blood, faeces and urine should be examined for the detection of pathogenic organisms, and a total and differential leucocyte count should be carried out; otherwise infectious cases may be treated as simple catarrhal jaundice. The occurrence of a polymorphonuclear leucocytosis in a case of jaundice is suggestive of leptospirosis in contradistinction to simple catarrhal jaundice.

712. Whooping Cough.—1. Whooping cough tends to occur in epidemics during the period October to April, especially in temperate climates. The infection is spread chiefly by "droplets" which are projected for a considerable distance by coughing. Pulmonary complications, including tuberculosis, are common in this disease and require to be specially guarded against.

2. *Carriers*.—These are of the respiratory type and are difficult to detect ; after suffering from this disease the patient may harbour the causal germ for a prolonged period and, therefore, the sputum of convalescents and contacts should be searched for the *Haemophilus pertussis* to eliminate carriers, if possible.

3. *Prevention of Infection*.—When a case of whooping cough occurs, the room, clothing, bedding, and feeding utensils should be disinfected. All immediate contacts should thrice daily practise naso-pharyngeal disinfection with 1 in 5,000 potassium permanganate solution in normal saline, and continue their normal duties, but be under medical supervision for three weeks.

Infants from the same household as the patient, and older children from the same household who have not had the disease should not attend school for at least a fortnight ; in the case of infants a six weeks' period is recommended. Sputum of contacts, where available, should be forwarded to the laboratory.

During outbreaks of the disease, children and young adults should be protected by means of anti-whooping cough vaccine. Subcutaneous injections of the vaccine should be given at three-day intervals for four doses, the first dose consisting of 100 millions, the second 200 millions, the third 300 millions, and the fourth 400 millions *H. pertussis*.

All attendants on the sick should wear gauze face-masks to lessen the danger of "droplet" infection.

4. *Isolation*.—All cases of whooping cough, suspects, and carriers will be isolated immediately ; the isolation should be maintained for fourteen days after the last whoop is heard, and the sputum is pronounced free from *H. pertussis* and *B. tuberculosis*. Every case should be isolated for at least six weeks. Precautions should be taken to prevent the occurrence of broncho-pneumonia throughout the disease and during convalescence. (See under "Measles", para. 596, clause A.)

Quarantine of contacts is not necessary, except for infants and children from the same household as the patient, who have not had the disease.

713. Yellow fever.—1. Yellow fever is due to a filter-passing virus conveyed to man by the bite of a mosquito (*Aedes aegypti*) which breeds in domestic water, haunts houses, and bites both by night and day. The disease occurs in West Africa and the Sudan as well as in Central America. A jungle form, not spread by mosquitoes, is now recognised. The incubation period in man is two to six days.

2. *Carriers*.—Man is infective for the first three days of the fever only. The virus undergoes a 12-day cycle of development in the mosquito before the latter is infective; the mosquito may remain infective for the rest of its life. There is evidence that the infection can pass direct from man to man, if infective blood comes in contact with the skin, therefore special care should be taken when performing blood examinations on yellow fever patients.

3. *Prevention of infection*.—In yellow fever districts, native quarters should be avoided as far as possible, camp should be pitched at least half a mile to the windward of natives, all persons should sleep under mosquito-nets, and such insecticides as "Pyrocid 20" or "Flit" should be used.

All stegomyia breeding-places should be abolished in and around the camp area. This mosquito can breed in small quantities of water, e.g., the dew collecting in old tins, bottles or leaves. Water cisterns and tanks should be protected against mosquitoes.

Persons intending to pass through or sojourn in yellow fever areas should be strongly advised to be protected against this disease by means of an 0.5 c.c. inoculation of pantropic yellow fever virus. Immunity develops within a fortnight. Revaccination should be performed yearly. There is usually no reaction other than slight headache.

As the mosquito that is capable of conveying yellow fever is practically world-wide in distribution, it is most important to see that infected persons, as well as mosquitoes, are not transported from place to place by aeroplanes, otherwise this disease might be spread to other parts of the globe. The inside of an aeroplane should be disinfected 15 to 30 minutes before departure with a suitable insecticide solution.

A suitable insecticide is "Pyrocid 20", 3 c.c. of which should be diluted 1 to 20 with completely volatilized kerosene, F.P. over 120° F. This makes 60 c.c. of diluted pyrocid for every 1,000 cubic feet air-space to be treated. In the absence of pyrocid, the following mixture should be made up:—

Kerosene	..	..	..	..	43.2 per cent.
Concentrated extract of pyrethrum (e.g. pyefly) ..	..	..	..	..	5.8 " "
Oil of citronella	..	..	..	..	2.0 " "
Carbon tetrachloride	..	..	..	..	49.0 " "

These insecticides are non-inflammable, non-injurious to man, but require to be used with a high pressure sprayer, as the finer the spray the more effective is its lethal action on mosquitoes, the time of exposure being 10 to 15 minutes; thereafter the aeroplane is ready for human occupation.

For the sanitary regulations in respect of yellow fever applicable in accordance with the International Sanitary Convention for Aerial Navigation, *see* A.P. 1269A.

4. *Isolation*.—All cases of yellow fever will be isolated in mosquito-proof buildings well to the leeward of other habitations, and nursed under a mosquito net. The building in which the disease was contracted should be thoroughly disinfested and a thorough search made for mosquito breeding-places, which should be destroyed if possible.

Contacts will be isolated for six days in a mosquito-proof building, and should sleep under a mosquito net.

All cases of fever occurring during a yellow fever outbreak should be isolated and treated as yellow fever for six days at least.

714. Long distance flights.—1. All personnel proceeding on flights to West or Central Africa should receive protective inoculation against yellow fever at least a fortnight prior to departure.

2. When in mosquito-infested districts, members of the flight should sleep under mosquito nets, and all internal compartments of aeroplanes should be thoroughly sprayed with insecticide ("Pyrocyde 20"), at least twice daily, and half an hour before departure from any port of call (*see* para. 713, clause 3).

3.—An adequate supply of drinking water should be carried, at least three gallons per person, for three days, plus a filled water bottle for each individual in the aircraft, also special flying rations, depending on the nature of the flight; examples are as follows:—

(a) *Special flying ration*.—Sufficient for three days' flight for one person.

<i>Item.</i>	<i>Quantity.</i>
Dried meat (<i>e.g.</i> pemmican or biltong)	2 lb.
Sandwiches, whole round	6.
Chocolate, milk or plain	$\frac{1}{2}$ lb.
Oranges	1 doz.
Apples	$\frac{1}{2}$ "
Bananas	$\frac{1}{2}$ "
Dried dates	$\frac{1}{2}$ lb.
„ figs	$\frac{1}{2}$ "
„ raisins	$\frac{1}{2}$ "
Sugar, ordinary lump	$\frac{1}{2}$ "
„ barley	$\frac{1}{2}$ "
Chewing gum	$\frac{1}{2}$ "
Peppermint lozenges	$\frac{1}{2}$ "
Coffee, black, unsweetened	4 quarts.
Horlick's milk tablets	$\frac{1}{2}$ lb.
Home-made cake	2 "

(b) *Special emergency flying ration.*—Sufficient for three days' flight for one person.

Item.				Quantity.
Sardines	..	..	..	$\frac{1}{2}$ lb.
Chocolate, ordinary plain	..	..	..	2 "
Chewing gum	..	..	..	$\frac{1}{2}$ "
Milk, condensed	..	..	..	2 tins.
Biscuits	..	..	..	2 lb.
Preserved meat	..	..	..	2 "
Tea	..	..	..	$\frac{1}{2}$ "
Sugar	..	..	..	$\frac{1}{2}$ "
Chocolate, emergency	..	..	..	4 tins.

In addition, Eau de Cologne spray is most refreshing to use when on long distance flights. (See also A.P. 112, Chapter I, paras. 16 to 19.)

4.—A special medical outfit will be included (see A.P. 132, Scale No. C2, and A.P. 1486, para. 39).

SECTION III.—INSTRUCTIONS FOR COLLECTING AND DESPATCHING SAMPLES AND SPECIMENS FOR CHEMICAL AND BACTERIOLOGICAL EXAMINATION.

720. Analysis of Water, Sewage and Food. Samples for examination and analysis from R.A.F. stations at home will be sent to :—

The Officer Commanding,

R.A.F. Institute of Pathology and Tropical Medicine,
Halton Camp, Nr. Aylesbury, Bucks.

721. Pathological Material. This will be sent to the R.A.F. Institute of Pathology and Tropical Medicine, Halton, whenever the examination and diagnosis cannot be carried out in the clinical laboratory of a hospital or a unit, and when a confirmatory opinion or special investigation is required.

Laboratory report form (Form 3212) will be completed in duplicate and forwarded with each sample or specimen, except water and sewage samples.

Samples should not be sent during the week-end, except by special messenger, as they are liable to be held up in the post or the railway over Sunday.

722.—1. Apparatus and containers for the transmission of pathological specimens will be indented for on Form 1209. Indents will be forwarded through the usual channels.

2. When a specimen is forwarded to the laboratory, the nature of apparatus and container will be written at the top left-hand corner of Form 3212. The officer in charge of the laboratory will return either the same or a similar piece of

sterile apparatus and container along with the pathological report to the unit concerned. By this means the stock of laboratory apparatus in each unit will remain constant, without the necessity of vouchering stores when each specimen is sent for examination.

723. Post Office Regulations regarding Substances sent by Post for Medical Examination or Analysis.—The Post Office has drawn up stringent regulations regarding the sending of articles for medical examinations or analysis. The following is an extract from the "Post Office Guide" :—

"Deleterious liquids or substances, though otherwise prohibited from transmission by post, may be sent for medical examination or analysis to a recognised medical laboratory or institute, whether or not belonging to a public health authority, or to a qualified medical practitioner or veterinary surgeon within the United Kingdom, *by Letter Post, and on no account by Parcel Post*, under the following conditions :—

Any such liquid or substance must be enclosed in a receptacle, hermetically sealed or otherwise securely closed, which receptacle must itself be placed in a strong wooden, leather, or metal case in such a way that it cannot shift about, and with a sufficient quantity of some absorbent material (such as sawdust or cotton-wool) so packed about the receptacle as absolutely to prevent any possible leakage from the package in the event of damage to the receptacle. The packet so made up must be conspicuously marked 'Fragile with Care,' and bear the words 'Pathological Specimen.'"

A.—Analysis of Water

724. Water for Analysis.—1. As regards the R.A.F. Stations in the United Kingdom, samples of water for bacteriological analysis will be submitted monthly from all stations having a well water supply, but normally only once a year from stations supplied by a water company or municipality, as the onus of providing a pure drinking water rests with them; the yearly analysis helps to keep a check on the cleanliness of storage tanks and service pipes. Chemical analyses will normally be done only for the first three years that a new water supply is in use, unless these analyses show definite variations in chemical composition. Convenient dates for forwarding samples will be made by direct arrangement between units and the Officer Commanding, R.A.F. Institute of Pathology and Tropical Medicine, Halton.

2. If at any time a special analysis is desired, owing to suspected contamination or other cause, the medical officer concerned will arrange direct with the Officer Commanding,

R.A.F. Institute of Pathology and Tropical Medicine, Halton, stating clearly the reasons for the desired examination. Copies of the medical officers' application will be forwarded to Air Ministry and to the P.M.O. of the Command concerned.

3. Abroad, those drinking water supplies which are directly under R.A.F. control and which normally are chlorinated, will be tested for chlorine, daily, to ensure adequate chlorination, and a sample will be submitted weekly for bacteriological analysis. Waters obtained from civil sources will be submitted for bacteriological examination to a Service laboratory, quarterly, to help keep a check on the cleanliness of station storage tanks and service pipes. Waters will be chemically analysed, as and when necessary, but not as a routine.

4. The water should be collected.

(a) for *chemical* analysis in a Winchester quart bottle ;

(b) for *bacteriological* examination in a sterilized 8-oz. bottle.

These bottles and containers will be supplied, ready for immediate use, by the Officer Commanding, R.A.F. Institute of Pathology and Tropical Medicine, Halton Camp.

When a medical officer has to prepare his own bottles, the simplest procedure is to cleanse a Winchester quart bottle with a little weak sulphuric acid, afterwards removing all traces of the acid by repeated washings with the water to be examined. A bottle that has contained ammonia should never be used. The bottle should be closed with a well-fitting glass stopper, or a new, freshly boiled cork. For bacteriological examination an 8-oz. medicine-bottle and a new cork should be boiled in a steriliser or saucepan for 30 minutes ; the boiling water is poured off, the bottle stoppered with the aid of sterile forceps, and allowed to cool before use.

5. *The Collection of Water Samples* will be carried out under the direct personal supervision of the medical officer of the unit concerned. At R.A.F. units, the water samples should be collected from the drinking water supply in the airmen's kitchen.

The water samples should be collected under similar conditions to those under which the water is drawn for drinking purposes. Specimens for chemical and bacteriological examination from any one source should be taken at the same point and at the same time. Before the bottles are filled they should be rinsed out thoroughly with the water to be examined.

(a) In the case of a *house tap*, the water should be taken from the lowest tap supplied from the cistern, which is usually that in the kitchen, in order to obtain water which has run the greatest distance in the house pipes. The mouth of the

tap should be flamed for a minute with a spirit lamp and then the water should be run to waste for five minutes before the samples are collected.

(b) A *well* should be pumped vigorously for five minutes before the water is collected. This aids in the detection of any flaw or contamination in the drainage area.

(c) *River, Reservoir, and Lake Waters* require a different procedure. A stout piece of string should be tied securely round the neck of the bottle in such a way as to leave a short and long end. The short end of the string should be about a foot in length and should have affixed to it a stone or weight sufficiently heavy to immerse the bottle below the surface of the water. The longer end, several feet in length, should be held in the hand of the collector to enable him to regulate the position of the vessel. A second piece of string should be attached to the stopper; thus the stopper can be removed from the bottle when the latter is immersed. In this manner contamination of the sample with surface scum will be avoided.

In every case the bottle should be filled so as to exclude all air, and then firmly stoppered.

Stoppers should be tied with string and finally secured with sealing wax.

Immediately after collection all samples will be clearly labelled, giving the following particulars:—

- (i) Name of station.
- (ii) Date and hour of collection.
- (iii) Source of sample (tap or well).
- (iv) Method of collection.
- (v) Geological character of soil and sub-soil of district.
- (vi) Nature and distance of evident or possible source of pollution.
- (vii) Rainfall during previous week (nil, small, moderate or great).
- (viii) Any special treatment that the water has received (boiling, chlorination, softening or clarification).
- (ix) Reason for desiring analysis.
- (x) Signature of officer sending water.

6. *Transmission of Samples.*—All samples will be carefully packed in their respective containers, labelled "Water sample," "With care," "Urgent," and forwarded immediately to the laboratory.

The specimen for chemical analysis will be forwarded by passenger train, R.A.F. Form 1486 being inscribed at the top "Per passenger train."

The smaller bottle, containing the water for bacteriological examination, will be despatched by post, or else packed in ice and sawdust and forwarded by passenger train.

B.—Analysis of Sewage Effluent.

725.—1. All R.A.F. stations at home that have their own sewage purification works will have a sample of the sewage effluent examined at least once a year. The necessary apparatus will be supplied from the R.A.F. Institute of Pathology and Tropical Medicine, Halton.

2. *Collection of Sewage Effluent.*—The effluent will be collected from the pipe which discharges from the humus tank. There is no need to collect samples at different times of day, as the fluid derived from the humus tank is a good representative mixture of at least 24 hours' sewage. A Winchester quart bottle should be completely filled for the chemical analysis, and an 8-oz. bottle for the bacteriological examination.

All samples will be clearly labelled giving the following particulars :—

- (a) Name of station.
- (b) Date and hour of collection.
- (c) Source of sample.
- (d) Method of sewage disposal on station.
- (e) Rainfall during previous week.
- (f) Reason for desiring analysis.
- (g) Signature of officer sending sample.

3. *Transmission of Sewage Effluent Samples* to the laboratory will be carried out as detailed for water samples.

C.—Analysis of Food and Beverages.

726.—1. The analysis of food may be required when its wholesomeness or quality is in doubt, or in the event of suspected food poisoning. In the latter case the competent medical authority of the command concerned and the pathologist will be informed immediately, so that their opinion can be obtained as to what articles of diet should be specially sent for examination.

2. *Method of Collection of Samples.*—(a) Special containers are not usually required. The *original container* should be forwarded if possible. If the original container is not available, the food sample should be packed in clean, sterile, glass-stoppered bottles or jars of suitable size. The glassware should be sterilized by boiling for one hour.

(b) All food samples will be collected under the direct personal supervision of the medical officer of the unit concerned. A fair average sample of the food should be obtained,

for instance, both crust and crumb of bread, and rind and interior of cheeses should be included; milk should be thoroughly mixed before the sample is collected.

(c) *The Collection of Milk Samples.*—It is most important that the medical officer be present when milk samples are being taken for test. He will ensure that the container is so shaken as to mix the milk thoroughly, prior to collecting the sample. *Under no circumstances will the medical officer express an opinion regarding the wholesomeness of the milk at this stage, as action for slander may follow.* In cases where disease (e.g., enteric fever or scarlet fever) occurs and there is strong suspicion that it is milk-borne, the medical officer will immediately inform his C.O. and Competent Medical Authority, also the local Medical Officer of Health. It is the duty of the local Medical Officer of Health to stop the suspected milk supply if he considers fit; in the meantime the medical officer may advise the C.O. that all fresh milk used in the unit should be boiled or pasteurized before use as a precautionary measure, but the name of the milk vendor or vendors must not be disclosed. Samples of milk suspected to be below the legal standard as regards the fat or solid non-fat content or thought to contain pathogenic organism will normally be sent for analysis to the Royal Air Force Institute of Pathology, Halton, or to some other suitable laboratory. If an adverse report is received, the medical officer will inform his C.O., but no action will be taken to stop the milk supply on these grounds, except through the local Medical Officer of Health, whose co-operation should be sought without delay.

(d) The minimum quantities to be forwarded for examination are as follows :—

Milk	..	..	..	1 pint.
Condensed milk	..	..	..	1 tin.
Dried milk	..	..	..	3 ozs.
Butter	..	..	..	4 ozs.
Margarine	..	..	..	4 ozs.
Cheese	..	..	..	4 ozs.
Bread	..	..	..	8 ozs.
Biscuits	..	..	..	8 ozs.
Flour	..	..	..	4 ozs.
Oatmeal	..	..	..	2 ozs.
Arrowroot	..	..	..	2 ozs.
Tea	..	..	..	2 ozs.
Coffee	..	..	..	4 ozs.
Cocoa	..	..	..	2 ozs.
Tinned meat or fish	..	..	..	1 tin.
Sausage	..	..	..	8 ozs.
Dried or smoked meat or fish	..	..	..	8 ozs.
Lard	..	..	..	4 ozs.

Tinned or bottled fruit or vegetable	1 tin or bottle.
Sugar	4 ozs.
Jam	4 ozs.
Golden syrup	4 ozs.
Confectionery	4 ozs.
Pepper or mustard	1 oz.
Vinegar	5 ozs.
Lime juice	5 ozs.
Beer or stout	10 ozs.
Spirits	10 ozs.
Aerated water	1 bottle or syphon.

(e) The following particulars will be forwarded to the laboratory:—

- (i) Name of station.
- (ii) Date of forwarding specimen.
- (iii) Nature of article of food sent.
- (iv) Source of the article.
- (v) Date of purchase or issue of the article.
- (vi) Exact examination required.
- (vii) Reasons for desiring analysis.
- (viii) Signature of officer sending sample.

(f) In addition, in cases of suspected food poisoning specimens of the patient's vomit and fæces should be forwarded, and a concise history of the illness stating:—

- (i) Name of patient or patients.
- (ii) Time elapsed between ingestion of suspected food and onset of symptoms.
- (iii) Synopsis of symptoms in order of occurrence.
- (iv) Condition of other people who had partaken of the food.

3. *Transmission of Samples.*—In the case of suspected food poisoning, all samples should be forwarded immediately packed in ice, the procedure being similar to that detailed for the transmission of water samples.

D.—*Pathological Material for Laboratory Examination.*

727. Agglutination Tests.—1. These tests, commonly called "Widal," are performed for the diagnosis of abdominal fevers and pyrexias of uncertain origin, such as enterica group, bacillary dysentery, food poisoning and undulant fever. In many of these conditions the infecting organism can be isolated from the blood before a positive agglutination test is obtainable. Thus it is advisable to make a blood culture at the same time, the blood being obtained by vein puncture.

2. *Method of Collection. Technique of vein puncture.*—The skin over the front of the elbow should be cleaned with methylated spirit or tincture of iodine.

The median basilic or cephalic vein should be rendered prominent by means of a bandage applied around the upper arm, aided by massaging upwards the skin of the lower arm, and by the patient firmly clenching his hand.

The fingers of the left hand should be placed behind the patient's elbow to support and extend the joint, while the left thumb should be used to fix the chosen vein.

A sharp sterile needle attached to a sterile 10 or 20 c.c. syringe should be held almost parallel to the chosen vein, and inserted into the vessel in the direction of the blood flow with the eye of the instrument facing the operator. If the puncture is successful, blood will enter the syringe.

With gentle traction on the plunger of syringe at least 10 c.c. of blood should be drawn off. The bandage should be removed from the upper arm, the syringe with needle should be withdrawn, and a pad of cotton wool soaked in spirit should be applied to the wound. The punctured skin should be gently moved to one side of the vein, and digital pressure re-applied over the wound for a few minutes to prevent the development of a hæmatoma. No dressing should be necessary.

Instead of using a syringe, the blood may be collected in a Behring's ampoule, which is issued complete with needle, the blood being drawn into the ampoule by means of the vacuum in the tube.

Five c.c. or more of blood should be used to inoculate broth tubes for cultural purposes, while the remainder of the blood should be transferred to a clean, dry sterile test tube for agglutination tests. If the agglutination test is all that is desired, then 1 c.c. of blood is sufficient, and should be obtained with a sterile hypodermic needle and syringe. Immediately after use the syringe and needle should be immersed in, and washed out with, cold water to prevent blood clotting in the needle. After an hour, the blood clot should be loosened from the sides of the agglutination tube by means of a sterile platinum needle, wire or glass rod.

3. *Transmission.*—The tube should be securely corked and forwarded at once to the laboratory; the serum will separate off *en route*.

4. *Information to be forwarded* with the specimen will include name of patient, a summary of symptoms, day of disease, dates and dosage of T.A.B. or other protective inoculations, and any history of previous diseases of this group.

728. Blood Cultures.—1. These should be made on all cases of pyrexia of unknown origin when the temperature remains up for more than three days. The earlier that blood cultures are performed in the course of a fever the more likely is a positive result to be obtained.

2. *Method of Collection.*—(a) The blood should be collected as described under the heading "Agglutination Tests" (para. 727). If a Behring ampoule is used, it should be one containing broth.

(b) *Media.*—Broth cultures are most valuable for the early isolation of organisms of the enteric, food poisoning and dysentery groups; for detecting septicæmia due to the streptococcus, staphylococcus, pneumococcus, *B. pestis*, *B. melitensis* and at times the meningococcus. For the cultivation of spirochetes, such as those of Weil's disease and rat-bite fever, or of leishmania, a special Wenyon-Noguchi medium is desirable.

(c) *Inoculation of Media.*—Small bottles of media ready for inoculation should be obtained from the nearest laboratory. If the bottle is protected with a rubber cap, the cap should be wiped with spirit and iodine, then punctured with the needle attached to the syringe containing the blood. From 5 to 10 c.c. of the blood should be ejected into the medium, the needle withdrawn, and a drop of melted wax spread over the top of the cap. The blood remaining in the syringe should be transferred to a sterile test-tube for the purpose of obtaining serum for agglutination or complement fixation tests.

3. *Transmission.*—The bottle containing the culture should be wrapped well in cotton wool, placed in a strong wooden box, and forwarded to the laboratory at once.

4. *Information to be forwarded* with specimens will include name of patient, summary of symptoms, date of collection, day of disease and amount of blood inoculated into the medium.

729. Blood Smears.—1. These may give direct evidence of such diseases as malaria, relapsing fever, filariasis, trypanosomiasis, kala-azar and at times septicæmia, by revealing the presence of the parasite concerned. Indirect evidence of disease may be gained by a differential leucocyte count carried out on a blood smear; thus an eosinophilia would suggest a helminthic infection such as schistosomiasis (bilharziasis), ancylostomiasis, trichinosis or filariasis. Sepsis would show a polymorphonuclear leucocytosis, while an increase of the large lymphocytes would point to a protozoal infection.

2. *Method of Collection.*—To prepare a blood smear, two absolutely clean glass microscope slides should be taken. A rapid method of cleaning these slides is to rub them firmly

about a dozen times with "00" sandpaper, and then to immerse them in absolute alcohol until required. The slides should be removed from the alcohol, dried and polished with a clean soft handkerchief immediately before use.

The thumb or lobe of the ear should be pricked with a sharp needle, the first drop of blood removed with a piece of cotton wool, and the succeeding drop received on a slide near the end. The lower end of a second slide should be placed on the first just in front of the drop of blood so that the blood spreads out between the slides in the acute angle thus formed. The slides should be kept at an angle of 45° to one another and the upper slide should be carried gently and evenly along the whole length of the lower one. The upper slide should rest solely by its own weight on the other. The films should be dried in the air. They may be waved about to aid drying, but should never be heated. They should be labelled and wrapped up at once to prevent flies and other insects contaminating them.

3. *Transmission*.—These slides should be sent to the laboratory in a small box (match, cigarette or safety-pin box). Two smears should always be sent; these, but only when thoroughly dried, should be placed face to face and wrapped round with paper and two rubber bands affixed to prevent damage in transit.

4. *Information to be forwarded* with specimens will include name of patient, summary of symptoms, date of collection, day of fever, and date when last dose of quinine or other medicine was taken.

730. Complement Deviation Tests.—1. These tests are usually performed for the diagnosis of syphilis (Wassermann reaction). At times similar tests are carried out to help in the diagnosis of gonorrhoea, hydatid disease, schistosomiasis, etc.

2. *Method of Collection*.—Blood serum is the usual fluid submitted to the complement deviation test, but the cerebrospinal fluid is frequently used in neuro-syphilis and parasymphilitic conditions. The blood sera should be collected with all aseptic precautions as described under agglutination tests and transferred to the narrow glass tubes provided for the purpose (see para. 726, clause 2).

3. *Transmission*.—At least 10 c.c. of blood, or 2 c.c. of serum, should be forwarded to the laboratory immediately.

4. *Information to be forwarded* with specimen will include name of patient, summary of symptoms, date of infection, amounts and dates of anti-symphilitic treatment, and results of previous complement deviation tests.

731. Cerebro-spinal Fluid.—1. This should be collected to assist in the diagnosis and treatment of cerebro-spinal meningitis, meningo-encephalitis, and indeed in most cases where increased intra-cranial pressure is known or suspected.

2. *Method of Collection.*—A general anæsthetic should not be required, unless the patient is delirious. Local anæsthesia with novocain over the site of puncture should suffice.

The patient should be placed on his right side with his back near the edge of the bed. The head should be bent forward with the knees well drawn up so as to arch the back thoroughly and extend the inter-laminar spaces as much as possible. The spinous processes of the vertebræ should be palpated to ensure that the spine is in the horizontal position. The highest point of each iliac crest should be marked and a line joining these points should cross the vertebral column at the level of the 4th lumbar spinous process. This process should be marked.

The puncture should be made slightly to one side of the mid line between the 4th and 5th, or 3rd and 4th lumbar spines. The skin over the site of puncture should be prepared with spirit, and a stout needle of at least 4 inches in length, pushed firmly forward, upwards and slightly inwards. A feeling of lessened resistance should indicate the penetration of the dura and, if the stylet be removed from the needle, spinal fluid should flow out unless the lumen be blocked. If this be so, the stylet should be inserted again to clear the blockage. The cerebro-spinal fluid should be allowed to flow directly into sterile test-tubes; at least two, preferably three, test-tubes should be used. From 5 to 10 c.c. of the fluid should be collected in each tube.

3. *Transmission.*—The tubes should be closed with sterile rubber corks and maintained at body temperature (37° C.), otherwise such organisms as the meningococcus will die. A simple method of maintaining this temperature is to wrap the test-tubes in several layers of cotton wool and then carry them to the laboratory either in the inside pocket of a jacket or in a bag along with a hot water bottle filled with water at about 40° to 45° C. A throat swab, or West's swab containing material from the posterior naso-pharynx, should be forwarded at the same time, as the meningococcus may be recovered from this situation when it is absent from the cerebro-spinal fluid. Such specimens should be sent by a special messenger.

4. *Information to be forwarded* with specimens will include name of patient, summary of symptoms, date and time of collection, and whether fluid was under pressure or not (rate of flow).

732. Fæces.—1. These may be required to be examined with the naked eye for foreign bodies, gall stones or worms ; chemically for the presence of fat, bile or blood, as aids to diagnosis in cases of suspected pancreatitis, hepatic disease, or ulcer of stomach or intestines ; or bacteriologically for pathogenic bacterial, protozoal or helminthic infection of the gut.

2. *Method of Collection.*—Three grains of calomel should be given at bedtime, followed by a quarter of an ounce of magnesium sulphate in the morning to obtain a free movement of the intestines and to increase the chance of sweeping out any infecting agent or material that may be in close apposition to the mucosa of the bowel.

Suspicious portions of the stool (blood or mucus) should be picked out with the scoop attached to the cork of the special fæces tube provided. Should the case be that of a suspected "cyst carrier" some of the solid part of the stool should be forwarded. In cases of urgency, a rubber catheter may be passed into the rectum and a specimen of fæces obtained in this manner.

When the test is for the presence of occult blood, the patient should be specially prepared for three days prior to the collection of the specimen of fæces. The preparation should consist of total abstinence from red and white meat, meat extractives, soups, coloured foods and medicines, especially iodides, iron and bismuth. On the morning of the fourth day the bowels should be moved with the aid of salts, and a specimen of the fæces sent to the laboratory.

In the case of suspected enteric or dysentery infection, the stools should be sent daily for at least a week. The urine and blood should be examined at the same time, as the causal organism may be present in one situation only.

It should be noted that in dysentery the bacilli are most easily found in the fæces during the first week, in enterica during the second or third week of the disease.

3. *Transmission.*—All samples of fæces for examination should be sent to the laboratory with the minimum of delay, as the non-pathogenic fæcal organisms are apt to outgrow and thus mask or destroy many of the pathogenic varieties.

4. *Information to be forwarded* with specimen will include name of patient, summary of symptoms, date and nature of any protective vaccine inoculations (T.A.B., etc.), any previous history of typhoid, dysentery or diarrhoea, and the time and place of service abroad.

733. Gastric Analysis.—This should be carried out in cases of suspected gastric or duodenal disease to investigate the

digestive and motor power of the stomach. The fractional test meal will be required in most circumstances, and for this purpose arrangements should be made to send the patient to the laboratory.

1. *Preparation of the patient* : a light supper before eight o'clock in the evening prior to the test. Two charcoal biscuits with a glass of milk at nine p.m. Nothing to eat or drink thereafter until the test meal is given in the morning in the laboratory.

2. *Preparation of the test meal* : two tablespoonsful of fine oats in two pints of water, simmered down to one pint, and then strained through gauze. This meal should be sent with the patient to the laboratory.

734. Gonorrhœa.—1. The discharge in all cases of urethritis and balanitis should be examined for the presence of the gonococcus or other pathogenic organisms.

2. *Method of Collection.*—(a) *In cases of acute gonorrhœa* the anterior urinary meatus should be cleansed with a swab to remove extraneous organisms, then a drop of the discharge should be expressed from the urethra and received on a glass microscope slide, previously flamed. A second flamed and cooled glass slide should be lowered on the top of the pus, which should now be spread out between the two slides. The slides should be gently and slowly drawn apart in the direction of their long axes and allowed to dry in the air. The dried films should be placed face to face, and packed as described under blood smears (para. 729). Two films should be sent in every instance. If the discharge is scanty, a specimen should be obtained by carefully passing a throat swab inside the meatus ; the material thus obtained should be spread on two slides.

(b) *Patients with chronic gonorrhœa* should pass part of their urine into a sterile medicine bottle, then the prostate and vesicles should be massaged to obtain some of the secretion, which should be received on glass slides as described above, and, finally, the remainder of the urine should be voided into another sterile bottle. It should be remembered that the early morning specimen is the most valuable. All specimens should be clearly labelled.

3. *Transmission.*—Two films should be sent in every instance, and should be packed in a small box to prevent breakage in the post.

4. *Information to be forwarded* with specimen will include name of patient, summary of symptoms and treatment received, time and method of collecting specimen.

735. Histological Specimens. — 1. *Transmission.* — Pathological material for sectioning should be forwarded to the laboratory immediately after removal. If possible, the whole specimen should be sent; failing that, good representative portions should be picked out. The specimen should be wrapped in sterile jaconet or gutta-percha tissue, and placed in a sterile bottle or tube, especially when tuberculosis is suspected, so that some of the tissue may be used for animal inoculation if necessary. Otherwise specimens should be placed in 10 per cent. formalin solution.

2. *Information to be forwarded* with specimens will include name of patient, summary of symptoms, exact origin of specimen, time of removal, nature of fixative and time of placing specimen in it, and any special examination desired.

736. Malaria Parasites should be searched for in ordinary blood smears (see "Blood Smears," para. 729).

737. Peridental Smears and Cultures.—1. These should be made in cases of pyorrhœa alveolaris and suspected oral sepsis. It should be remembered that a streptococcal infection of the alveolar tissues may be the cause of septicæmia, muscular rheumatism, sciatica and iritis.

2. *Method of Collection.*—To collect a specimen, the patient's gums should be thoroughly rinsed with water, and the mucosa around the neck of the chosen tooth should be cleansed with cotton wool. Digital massage should be applied to the gum to remove as much of the surface pus as possible; this pus should be wiped away, and massage re-applied. The pus that now appears should be carefully collected on a sterile throat swab.

3. *Transmission.*—All swabs should be sent to the laboratory as rapidly as possible.

4. *Information to be forwarded* with specimens will include name of patient, a summary of symptoms, and a statement as to whether an autogenous vaccine is required.

738. Pus should be collected in a sterile test-tube or on a sterile throat swab. The information to be forwarded with specimens should include nature and duration of infection, exact origin of pus and whether a vaccine is desired.

739. Septic fluids, such as those obtained by aspiration from pleura, pericardium, peritoneum, tunica vaginalis or joints should be collected aseptically in a sterile bottle or tube. The specimen should be kept at body temperature and forwarded with the following information:—name of patient, summary of symptoms, and source of fluid.

740. Spironemata. Suspected syphilitic sores should be searched for spironemata in the serum obtained from them. The sore should be cleansed with saline, dried with wool, and then gently squeezed to cause serum to exude. This serum should be collected in capillary glass pipettes and the ends sealed in the spirit flame. The pipettes should be carefully packed in a box and forwarded to the laboratory with the name of the patient, summary of symptoms, any history of exposure to infection and any treatment received.

741. Sputum.—1. This should be examined in all cases of chronic cough or any pyrexia associated with expectoration.

2. *Method of Collection.*—It should be ascertained that the specimen has been derived from the lower, and not the upper air passages. In addition, contamination of the sputum with organisms derived from the buccal cavity should be guarded against. For these reasons the early morning sputum should be collected, after the patient has cleansed his teeth, and washed out his mouth several times with cooled boiled water. The specimen should be expectorated directly into a sterile sputum pot. If a culture of the sputum is required, phenol or other disinfectant should not be added to the collecting vessel.

It should be remembered that the tubercle bacillus is most frequently found in purulent, muco-purulent or cheesy sputa, rarely in mucus, saliva or blood. After a hæmorrhage it may be necessary to wait until the character of the sputum has changed before the tubercle bacillus can be detected. Should the sole object of the examination be the preparation of smears for the tubercle bacillus, a little 1-20 phenol solution should be added to the sputum. A potassium iodide mixture stimulates expectoration in cases with scanty sputum.

3. *Transmisson.*—The sputum should be forwarded to the laboratory in a sterile sputum pot.

4. *Information to be forwarded* will include name of patient, a summary of symptoms, and a statement as to whether any disinfectant has been added to the sputum.

742. Throat swabs.—1. These should be collected from all cases of tonsillitis where there is the least suspicion of diphtheria or suggestion of a membrane.

2. *Method of Collection.*—No local antiseptic treatment should be applied during the previous 12 hours. The tonsils should be well exposed, and the swab should not touch anywhere except the ulcer or chosen mucosa. A second swab should always be taken from the deeper part of the ulcerated area. In cases suspected of cerebro-spinal meningitis, a swab should

be taken from the posterior naso-pharynx. The throat swab should be bent at an obtuse angle or a West's swab used, and kept at body temperature (*see* para. 684, clause 4).

3. *Transmission*.—All swabs should be sent to the laboratory as rapidly as possible.

4. *Information to be forwarded* with specimens will include name of patient, summary of symptoms, day of disease, temperature, site and nature of any pain, and exact source of specimen.

743. The Urine.—This should be examined by the medical officer in charge of the patient for albumin, blood, sugar and bile, in every case of illness. Should any abnormality be found, a specimen should be forwarded to the laboratory for a more detailed examination.

2. *Method of Collection*.—(a) In most cases the urine passed on first rising in the morning should be collected. The foreskin should be retracted, the glans cleansed with 1-60 phenol, a little of the urine voided and the remainder passed directly into a sterile 8-oz. medicine bottle, which should be closed with a sterile cork. The cork should be sterilised by boiling for at least 10 minutes.

(b) *Quantitative Estimation*.—Should a quantitative estimation of sugar be desired, the patient's urine should be collected in a large vessel for twenty-four hours, thoroughly mixed, measured, and an 8-oz. medicine bottle filled with a representative portion. The total amount of urine passed should be stated on the bottle.

3. *Transmission*.—The sterile bottle containing the specimen of urine should be securely sealed and packed in a strong wooden box ready for transmission to the laboratory.

4. *Information forwarded* with specimens will include name, summary of symptoms, examination required and method of collection.

744. Vaccines.—1. All material to be sent for the preparation of autogenous vaccines should be collected aseptically and forwarded by express post. The advice of the pathologist should be sought in all doubtful cases. Information forwarded with specimens should include name, age, summary of symptoms, duration of complaint, any previous vaccine treatment and result.

If it is considered advisable to interrupt or cease the vaccine therapy, the medical officer in charge of the case should inform the pathologist concerned, and at the end of a course of vaccine treatment, he will inform the pathologist of the result of such treatment.

CHAPTER IX

ROUTINE PATHOLOGICAL EXAMINATION IN
RESPECT OF FLYING EFFICIENCY

750. 1. It has been aptly stated that pathology is physiology gone wrong. This is perhaps the best conception of what the term "disease" means, and it forms a satisfactory basis on which to build up a routine pathological examination for flying personnel. There is no sharp line of demarcation between physiological and pathological tests,—the one set merges into the other; by the former it is sought to ascertain whether the individual is normal, by the latter to detect any abnormality and its cause.

2. In the Royal Air Force the flying personnel are systematically kept under physiological observation, and every year each officer is tested for physical fitness in conjunction with his confidential report. Thus any abnormalities that may have developed during the previous twelve months are detected, and, unless the condition can be remedied at the station, the case is sent before a special medical board. If the board decides that any case is physiologically inefficient or doubtful, a routine pathological examination is often carried out to aid in the assessment of the nature and probable duration of the disability.

A.—Scheme of Routine Pathological Examination

751. The following scheme has been adopted for all cases sent for such examination :—

(a) *Blood Tests—*

- (i) Counts. Red blood corpuscles per cubic millimetre.
Hæmoglobin percentage.
Colour index.
White blood corpuscles per cubic millimetre.
Differential leucocyte count (400 cells).
Examination for parasites.

(ii) Culture.

- (iii) Agglutination against *B. typhosum*
B. paratyphosum A, B and C
B. enteritidis Gaertner
B. dysenteriae Shiga
B. dysenteriae Flexner
B. dysenteriae Sonne
B. melitensis
B. abortus

(iv) Wassermann, Meinicke or Kahn reactions.

(v) Hæmagglutinins.

(vi) Blood urea.

(b) *Urine Tests*—

- (i) Routine. Specially examined
for albumin
blood
pus
sugar
casts
ova of schistosoma
(bilharzia)
T.B. and other pathogenic
bacteria.

(ii) Renal efficiency tests.

(c) *Fæces*—

For pathogenic bacterial, protozoal, or helminthic infection.

(d) *Sputum*—

If available.

(e) *Throat Swabs and Peridental Smears*—

If any indication of oral sepsis.

B.—Procedure for carrying out Tests

752. 1. The tests are carried out at a definite hour of the day, namely, 8 a.m., the object of this being to render the results of all examinations comparable. This point will be appreciated when it is recollected that certain physiological processes vary with the time of day, and when these processes are abnormal the variation may be greater. For example, the period of time that has elapsed since the last meal will materially affect the total leucocyte count and the urea excretion.

2. The renal efficiency tests, occupying as they do the period of two hours, are started first. The subject is instructed to empty his bladder into a sterile flask, and this urine is used for the complete routine examination. Thereafter the urea meal is administered, and as further specimens of urine are collected at hourly intervals for the next two hours, there is plenty of time to carry out the remaining tests.

3. The subject is now given a history form to fill in, to supply particulars required for record purposes, and to aid in the interpretation of the results of certain tests. For example, the date of protective T.A.B. inoculation affects the agglutination test; a possible increased red blood count must be allowed for in subjects who have recently done much high flying or have sojourned long in a hot climate.

4. The blood count and hæmagglutinin tests are then proceeded with, but the collection of blood for Wassermann test, agglutination and culture is delayed until the end of the second hour, when the vein is punctured to obtain blood for the estimation of its urea content.

5. The results of the tests are recorded on Forms 473 and 474 designed to reduce clerical work to a minimum. A specimen of the blood and faeces report on Forms 473 and 474 is shown :—

Enclosure No.
in Form 48.....

FORM 473.

ROYAL AIR FORCE.

ROUTINE PATHOLOGICAL OVERHAUL.

Report No.....

Name.....Rank and Official No.....

Hospital or Unit.....Age.....

Clinical Diagnosis.....

BLOOD EXAMINATION.

Date and hour of collection of sample.....Temperature.....

Red blood corpuscles.....per cu. mm.

Hæmoglobin percentage.....

Colour index.....

White blood corpuscles.....per cu. mm.

Differential Leucocyte Count (400 cells counted) :—

Small mononuclear lymphocytes.....%

Large mononuclear lymphocytes.....%

Hyalines.....%

Transitionals.....%

Neutrophil polymorph. leucocytes.....%

Eosinophil polymorph. leucocytes.....%

Basophil polymorph. leucocytes.....%

.....% Non-granular.

.....% Granular.

..... Arneth index.....

Blood parasites.....Weighted mean=.....

Blood culture.....Sedimentation rate.....mm. in 1 hr.

Wassermann reaction.....Van den Bergh.....

Agglutination test.....Method.....Time.....

ORGANISM.	DILUTION OF SERUM.					
	$\frac{1}{25}$	$\frac{1}{50}$	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{500}$	$\frac{1}{1000}$
B. typhosus.....
B. paratyphosus A.....
B. " B.....
B. " C.....
B. enteritidis Gaertner.....
B. dysenteriae Shiga.....
B. " Flexner.....
B. " Sonne.....
B. melitensis.....
B. abortus.....

Date of last protective T.A.B. inoculation.....

FAECES

Pathogenic bacteria.....

Pathogenic protozoa.....

Pathogenic helminths.....

Occult blood.....

(Note.— For reverse of Form, see para. 753).

C.—Remarks on the Tests

753. Blood Counts.—1. These are collected from the thumb, as blood obtained from the lobe of the ear gives varied and erroneous results, due to the tendency of the circulation to stagnate in the latter situation, especially during the cold weather.

2. The normal red blood-corpuscle count is accepted as six millions per cubic millimetre for all flying personnel under 30 years of age. Above that age five-and-a-half or five millions per cubic millimetre is taken as normal, depending on the history of the case.

3. A rapid, simple and efficient method of staining is employed. A 0.5 per cent. solution of Leishman stain in methyl alcohol is used. The stain is kept in a stoppered cylindrical staining jar of sufficient size to receive at least four slides. By placing the slides in the pot in pairs, back to back, four slides can be stained at the same time. The specimens are left in this stain for five minutes, then rapidly washed in distilled water, allowed to dry in the air and are then ready for examination. The same stain may be used for hundreds of slides provided the pot is well stoppered. This method of staining prevents the appearance of artefacts derived from the distilled water, lessens the chance of deposit and saves much time.

4. For the differential count four hundred cells are counted, and the following seven types of cells are recognized :—

- (a) Small mononuclear lymphocytes.
- (b) Large mononuclear lymphocytes.
- (c) Hyalines.
- (d) Transitionals.
- (e) Neutrophil polymorphonuclear leucocytes.
- (f) Eosinophil polymorphonuclear leucocytes.
- (g) Basophil polymorphonuclear leucocytes.

5. This division has been found adequate for most of the information required from a blood count. Many medical men are dubious of the value of differential counts, but in the hands of careful workers, knowing their own standards, much valuable information may be given which may point to the correct diagnosis and direct the line of further investigation.

754. Blood Culture.—As is to be expected, the blood culture is in most cases negative, but its adoption as a routine test is justified by its value in the few early positive cases where correct and immediate treatment is of vital importance. Cases have occurred in which its use had been omitted, and

where an early positive result could probably have been found; the after history of these cases emphasises the necessity for routine blood culture.

755. Agglutination Tests.—The routine agglutination test is carried out by Garrow's method in the following dilutions :—1/10, 1/50 and 1/100. Positive or doubtful findings by this method are controlled by Dreyer's technique. This test, in addition to being of value in detecting evidence of present or recent infection with the organisms tested for, acts as a check on the efficiency of the protective T.A.B. vaccine in use.

756. Wassermann and Meinicke Tests.—The Wassermann test is performed by the Browning-Mackenzie method and is found very reliable. The Meinicke test is also carried out and gives equally reliable results; it is more simple in practice. The difficulty of keeping guinea-pigs during the hot weather in warm climates makes the supply of complement a difficult problem. It is on this account that the Meinicke test has been adopted for routine work in R.A.F. laboratories overseas.

757. Hæmagglutinins.—The knowledge of the group hæmagglutinins in any case of a severe crash is of great value. Moreover, by doing a thorough routine examination on all available personnel, a rapid means is afforded of certifying healthy blood donors. If the Wassermann test were performed only on suspected syphilitics, the suitability of the donor available would be very dubious. Similarly, a would-be donor, who had done service overseas, might have no history of malaria and yet show signs of the disease in his blood.

758. Blood Urea.—The blood urea is determined by the method of MacLean and de Wesselow. The normal blood urea is accepted as being somewhere below the level of 40 milligrammes per 100 cubic centimetres of blood in an individual under 30 years of age, and in any person a figure of 50 milligrammes and over is suggestive of abnormal urea metabolism. In cases of albuminuria without the presence of casts or pus, it is not possible to give a definite opinion of the cause in the absence of a blood urea estimation. In fact, patients come to the laboratory with a history of a normal urinary urea output, and yet an estimation shows that this output is only attained by an increased head of urea in the blood. Thus, it is more satisfactory to all concerned to do full renal efficiency tests in every case.

759. Urine.—Renal Efficiency Tests.—1. The renal efficiency is tested after the administration of fifteen grammes of urea dissolved in 100 cubic centimetres of water, also by flooding

RENAL EFFICIENCY TESTS.

GENERAL CONCLUSIONS.

Date..... Officer in Charge of Laboratory.

(Note.—Reverse of Form 473 referred to in para. 752.)

2. As regards the urea concentration test, the normal urinary urea output is taken as 2·5 per cent. or over ; in calculating this percentage, due allowance is made for the quantity of urine passed. The urea concentration factor is considered to be most important and the normal figure is taken to be over seventy. The diastatic index is only performed as a supplementary test. Abnormal urinary constituents such as albumin, casts, pus and blood, especially in conjunction with an estimation of the chlorides, help to differentiate between parenchymatous and interstitial kidney lesions. The blood-pressure and state of the circulatory organs are investigated to ascertain whether any defect found is entirely renal.

3. *The flooding test* is simple to perform even at a Station, and often gives evidence of impairment of renal function. The patient should have nothing to eat or drink after supper, and first thing in the morning should empty his bladder, the specimen being kept ; then he should drink two pints of water. He is instructed to pass his urine half-hourly for three to four hours into marked containers. The amount of urine passed

each half-hour is measured and the specific gravity taken. A normal person should, during this test, pass approximately two pints of urine in three to four hours; if less than one-and-a-half pints is passed, there is probably a renal defect. The case should then be investigated further. In warm climates or during hot weather, due allowance must be made for sweating.

4. The great value of these tests lies in the detection of vascular and interstitial changes in the kidneys. Chronic toxic conditions at any early stage may have a distinct, if moderate, effect on the urea metabolism. Thus in chronic alcoholics, before permanent lesions are apparent, the water excretion is often found to be abnormal. This, along with evidence of physical inefficiency, is an early sign of more damage to follow, unless the cause is removed. It is difficult to be sure, without the patient's admission, as to the exact toxin at work, but the complete examination eliminates many causes. Moreover, the results of the test are apparent to the patient, who is readily convinced of the damage done. By informing him that the present lesion is probably temporary and will become normal, if the excesses are stopped, the average patient sees reason, and is rendered more efficient. Further tests performed at intervals of a month or so show whether the case is likely to recover, and to what degree.

5. Although the newer renal tests are of great value, the older tests must not be ignored. Thus, cases of renal tuberculosis have been met with where full efficiency tests have revealed a defective renal excretion, but the urine had not been examined for the tubercle bacillus. Cases of slight albuminuria have been from time to time encountered, also, in which a detailed examination has revealed either the ova of *Schistosoma hæmatobium* or the *Bacillus tuberculosis* to be the cause of the trouble. In some cases the condition had been overlooked for a considerable period of time. For this reason microscopical and cultural examinations are performed on all urines, and the deposit is always stained for the tubercle bacillus.

6. The following case illustrates the importance of investigating the cause of all instances of albuminuria. The patient was born in Bareilly, India, in 1901, and came to England in 1903. He went to South Africa (Orange Free State and Natal) in 1906, and remained there until September, 1914, when he returned to the United Kingdom. He had not been out of the United Kingdom since that date, or in other words, for nine years. The man claimed to have enjoyed perfect health at all times. He appeared before the Central Medical Board in April, 1923, to be tested for fitness to become a non-commissioned officer pilot, but was rejected on account of albuminuria.

Subsequent examination revealed a heavy infection with living ova of *Schistosoma hæmatobium*. Had this patient not applied to become a pilot this infection would probably have escaped notice, and as he was on the waiting list for overseas the results might have been disastrous.

760. Fæces.—The importance of the early detection and eradication of infections of the gut with recognized pathogenic bacteria, protozoa and helminths is agreed upon by all, but this does not hold good for *Lamblia* (*Giardia*) *intestinalis*. That *Lamblia intestinalis* is pathogenic is suggested by the following observations. Repeatedly, during a routine investigation of a case, the blood picture has favoured the diagnosis of a protozoal infection, and on completing the examination the presence of lamblia in the gut has been the only abnormality found. Further, with the eradication of the parasites, improvement in the patient's general condition has followed. Many such patients show loss of nerve and muscle tone, as is made evident by the physical efficiency tests, and especially by the presence of heterophoria. Because infection with lamblia is so common in warm climates, and so difficult to eradicate, it is convenient to label it as non-pathogenic. The common cold occupies a similar position in these climes, but its pathogenicity is now no longer doubted.

761. Sputum.—Tuberculosis is so common and starts so insidiously that it is liable to reveal its presence first in the form of a lowered physiological efficiency. On this account the sputum is always examined, if available.

762. Throat Swabs and Peridental Smears.—The mouth, teeth and gums are examined as a routine in the laboratory. Oral sepsis, probably by virtue of the large blood-supply to the mucosa of the mouth, may cause rapid and profound symptoms of sepsis, the first signs of which are often of a nervous nature. Such defects are readily revealed by the general efficiency tests. The diphtheria bacillus is not the common offender here, but most frequently it is Vincent's bacillus and spirionema, or a streptococcus.

763. Blood-sugar Content.—The blood-sugar content is not estimated unless there is a glycosuria. It has been found advisable to do full glucose tolerance curves on patients with sugar in the urine to make a correct diagnosis; the majority of these cases have proved to be examples of "lowered renal threshold" or defective liver storage, and not true diabetes.

CHAPTER X

DIFFERENTIAL DIAGNOSIS FROM THE POINT OF VIEW OF BACTERIOLOGY AND CLINICAL PATHOLOGY.

770. In view of the aid given by the clinical pathologist and bacteriologist in the quick diagnosis and expert treatment of certain diseases, as well as in the prevention of spread, and extermination, of those of an infectious or contagious nature, attention is drawn to the great importance of making early use of such help. With the advance of medicine these methods are continually assuming an increasing importance, not only in regard to general medicine at home but even more so in connexion with diseases met with during service in tropical and sub-tropical climates.

771. Since the diagnosis of a disease is often determined by a careful study of signs and symptoms, a list of these alphabetically arranged is here given with their diagnostic significance :—(a) As an aid towards the rapid narrowing down of the field of differential diagnosis ; (b) To draw attention to such pathological and bacteriological measures as should be undertaken by the medical officer as soon as possible.

Particulars in regard to the methods of sending specimens to the laboratory are given in paras. **720-744**, and must be complied with in exact detail.

772. In respect of tropical and sub-tropical diseases further information is given in the War Office "Memoranda on Medical Diseases in Tropical and Sub-Tropical Areas," which is issued to all medical officers. In addition, standard text-books in regard to any particular disease should be consulted when necessary.

A.—ALBUMINURIA

773.—1. The presence of albumin in the urine may be of great or little importance. All cases of albuminuria require careful investigation, and most information is to be gained from renal efficiency tests which aim at ascertaining the condition of physiological balance between blood and kidneys. The chief point to be decided is whether the albuminuria is purely functional or organic, and if the latter, what is its origin. So-called functional cases may be attended with a distinct amount of albumin of relatively minor import, whereas advanced chronic interstitial nephritis may be accompanied by little or no albuminuria. In addition, slight albuminuria may be met with in cases of pathogenic infection in which a detailed urinary examination will reveal the cause of origin—e.g. the presence of *Bacillus coli*, of *Bacillus tuberculosus*, or of the ova of *Schistosoma hæmatobium* (bilharzia).

2. *Clinical Observations.*—Albuminuria may be conveniently divided into the following types :—

(a) *Physiological* : Occurs often in adolescence, especially after certain forms of muscular exercise.

(b) *Cardiac* : Associated with such conditions as valvular disease and high blood-pressure.

(c) *Nephritic* : Inflammatory as in fevers and nephritis generally, congestion, tumours and calculi.

(d) *Lower renal tract* : Inflammation due to gonorrhoea, tuberculosis, schistosomiasis (bilharziasis) and filariasis, congestions, tumours and spermatorrhoea.

(e) *Toxic* : Due to drugs, such as cantharides, santonin, mercury.

(f) *Bacterial* : Found especially with *Bacillus coli* infections.

3. *Laboratory Tests.*—In all cases of albuminuria an early morning specimen of urine should be sent for investigation with full details of the case and a flooding test may be performed at the station, as described at para. 759, clause 3. The pathologist will advise as to any further tests which may be necessary.

B.—BLOOD IN THE URINE

774.—1. The appearance of blood in the urine may denote the presence of whole blood, termed hæmaturia, or of hæmoglobin alone, designated hæmoglobinuria. The microscope is the quickest and safest method of detecting blood, and deciding whether the case is one of hæmoglobinuria or hæmaturia. The blood may enter the urine at various points along the genito-urinary tract, therefore the anatomy of this apparatus must be borne in mind. In bleeding from the kidney the blood is well mixed with the urine. Hæmorrhage from the bladder usually demonstrates its presence towards the end of micturition, whereas that from the urethra appears with the urine which is voided at the beginning of the act.

2. *Clinical Observations.*—The common causes of blood in the urine are :—

(a) inflammation, trauma, tumour or calculi of the urinary tract ;

(b) blackwater fever ;

(c) schistosomiasis (bilharziasis) ;

(d) Weil's disease or leptospirosis icterohæmorrhagica ;

(e) snake-bite ;

(f) certain drugs—e.g., cantharides, sulphonals

The employment of X-rays may help materially in determining the cause of the hæmaturia.

3. *Laboratory Tests*.—All specimens for the investigation of this condition will be collected aseptically and transmitted to the laboratory as rapidly as possible. This is particularly necessary owing to the fact that the condition is often associated with renal tuberculosis or schistosomiasis.

C.—COUGH

775.—1. *Clinical Observations*.—(a) It is to be realized that in cases complaining of a chronic cough clinical examination of the lungs is not sufficient. Especially is this so when the cough is dry, since such is frequently due to extra-respiratory causes, for example :—

- (i) cervical adenitis and adenoids ;
- (ii) laryngitis ;
- (iii) mediastinal tumours ; aortic aneurysm ;
- (iv) pleural irritation, as is seen in simple pleurisy or in liver abscess.

(b) It is to be noted also that intra-pulmonary causes include, in addition to the effects of commoner organisms which attack the lungs—

- (i) helminthic infections (ancylostomiasis and schistosomiasis) which frequently give rise to a bronchial irritation during the development of the parasites ; and
- (ii) such infections as malaria, undulant fever, enterica, relapsing fever and plague, in which bronchitis is frequently a symptom.

It is advantageous, where possible, to have the thorax X-rayed.

2. *Laboratory Tests*.—Sputum should be examined in all cases of chronic cough or fever associated with expectoration. In addition, the examination of urine, fæces and blood may afford valuable information in some cases and accordingly should always be examined where any doubt exists as to the cause of the condition.

D.—CONSTIPATION

776.—1. Constipation leads to the retention of toxic bodies in the alimentary tract, later to the absorption of these into the general circulation, and thus tends to lower the general health. The condition is serious, even in temperate zones, but in warm climates it is decidedly worse, because it is a great predisposing factor to the occurrence of heat-stroke and infections of the alimentary tract. In warm climates, therefore, it is well not to wait for patients to report sick with this symptom, but by means of lectures or pamphlets to bring home to everyone the dangers attendant on constipation. It

is a wise saying: "Keep the bowels open and the mind easy," for this simple precaution will prevent much avoidable ill-health and will increase the available mental capacity.

2. *Clinical Observations.*—Many people are always somewhat constipated, but, whenever a patient complains of this symptom a detailed clinical examination should be made to differentiate, if possible, between cause and effect. The commoner causes are:—

- (a) ill-regulated personal life, that is failure to go to stool at a definite hour;
- (b) eating too much or too little, or the wrong type of food;
- (c) loss of muscular tone, due chiefly to lack of exercise;
- (d) local or general diseases, such as tumours or strictures of large bowel, or certain fevers.

The efficient prevention and treatment of this condition is to forestall or remove the cause.

3. *Laboratory Tests.*—In certain cases it will be found advisable to forward material (particularly fæces and blood) for the exclusion of the diseases indicated under 2 (d) above.

E.—DIARRHŒA AND DYSENTERY

777. 1. These in themselves are not diseases but symptom-complexes of many diseases. All that the term "diarrhœa" denotes is frequency or looseness of stool; "dysentery," the passage of blood, mucus, or both, from the lower bowel, accompanied by colic or tenesmus. Many cases of dysentery are ushered in by a diarrhœa. Moreover, an attack of diarrhœa may predispose the patient to dysentery, or be an early symptom of enterica or cholera. In the tropics and sub-tropics all cases of diarrhœa should be treated on strict lines until their true nature is apparent.

Some idea of the great variety of possible causes of diarrhœa and dysentery may be gathered from the table given below:—

Table III.

Possible Causes of Diarrhœa and Dysentery.

- (a) Mineral kingdom
 - (i) Sand.
 - (ii) Mica.
 - (iii) Waters rich in sulphates.
 - (iv) Drugs.
- (b) Vegetable kingdom
 - (i) Chiefly undigestible vegetable matter.
 - (ii) Moulds.

(c) Animal Kingdom—

- (i) Bacteria - Cocci - *Streptococcus* or *Enterococcus*.
 Bacilli - *B. dysenteriae* Flexner.
B. dysenteriae Shiga.
B. dysenteriae Sonne.
B. Morgan No. 1.
B. Eyre No. 9.
B. typhosus.
B. paratyphosus A. and B.
B. tuberculosis.
B. pyocyaneus.
B. prodigiosus.
B. proteus vulgaris.
B. faecalis alkaligenes.
B. enteritidis sporogenes.
Vibrio cholerae.
 Spironemata - *Treponema pallidum*.
- (ii) Protozoa - Sarcodina - *Entamæba histolytica*.
 Flagellata - *Lamblia intestinalis*.
Trichomonas intestinalis.
Tetramitus mesnili.
Leishman-Donovan body.
 Sporozoa - *Plasmodium falciparum*.
 Infusoria - *Balantidium coli*.
Nyctotherus faba.
- (iii) Helminths - Cestoda - *Tænia saginata*.
 (Tape worms). *Tænia solium*.
Dibothriocephalus latus.
 Trematoda - *Schistosoma mansoni*.
 (Flukes). *Gastrodiscoides hominis*.
Watsonius watsoni.
Heterophyes heterophyes.
Paragonimus westermani.
 Nematoda - *Ancylostoma* or *Necator*.
 (Round worms). *Ascaris lumbricoides*.
Oesophagostoma apiostomum.
Oxyuris vermicularis.
Trichocephalus dispar.
- (iv) Arthropoda - Insecta - *Diptera* (larvæ of certain flies).
 Arachnida - *Acarina* (certain mites).
- (v) Unclassified - Carcinoma recti.
 Hæmorrhoids.
 Foreign body in rectum.

Briefly, diarrhœa and dysentery are induced by some mechanical or chemical irritation of the gut. If the irritation is mild a simple hyperæmia and hypersensibility of the gut

results, leading to frequency of stool. With increase of irritation there is further congestion of the bowel, overaction of its mucous glands, and later ulceration, producing such symptoms as looseness of stool, passage of mucus and blood. It is purely a matter of degree and the therapeutic problem is to lessen the degree. This can only be done by the rapid removal of the cause, and the application of rest and soothing remedies to the injured tissues.

2. *Clinical Observations.*—The foregoing table emphasises the importance of a proper routine examination. This should comprise a careful history and investigation of the case, bearing in mind the possibility of such diseases as cholera, enterica, syphilitic or tuberculous infection of the gut, carcinoma, hæmorrhoids, and malignant malaria.

3. *Laboratory Tests.*—(a) The whole of the first motion passed should be sent to the laboratory or, failing that, selected portions such as blood or mucus, the specimens being carefully protected against insects, especially flies.

(b) A blood smear for parasites, and perhaps a blood culture should also be sent. In enterica and at times in bacillary dysentery the causal organism can be isolated by means of blood culture during the first few days of disease.

The rapidity with which a diagnosis can be made rests greatly on the celerity with which a fresh sample of fæces is forwarded to the laboratory. Depending on the nature of the case, a report from the pathologist may be expected after an interval varying from 10 minutes to 48 hours. In the meantime, the patient should be put on the routine treatment for all acute cases of diarrhoea and dysentery unless there are definite symptoms or signs pointing to some specific cause, such as amœbic or bacillary infection, when specific treatment should be instituted immediately.

F.—FEVER

778.—1. The great importance of the early laboratory investigation of fever is not sufficiently appreciated. In the tropics and sub-tropics where the conservation of energy is of prime importance, all short cuts to establishing a correct diagnosis of a fever are to be highly recommended and welcomed. Concomitant with the clinical examination there is no surer method of demonstrating the cause of the fever than by the isolation or detection of an organism commonly associated with fever, bearing in mind that in some cases more than one cause may be at work. In cases of fever the physician and pathologist must work hand in hand; in fact, it is not going too far to say that with tropical fevers the help of a laboratory is absolutely indispensable.

The common causes of fever in the tropics and sub-tropics are as follows :—

Fevers likely to be encountered in the Tropics and Subtropics.

Malaria.
Typhoid.
Paratyphoid A, B and C.
Gaertner group of food poisoning.
Dysentery—bacillary.
Liver abscess (amœbiasis).
Relapsing fever.
Undulant, Malta or Mediterranean fever.
Tuberculosis.
Syphilitic fever.
Pneumonia.
Influenza.
Plague.
Heat-stroke.
Weil's disease or leptospirosis icterohæmorrhagica.
Sandfly fever or phlebotomous fever.
Dengue.
Seven day fever.
Rat-bite fever.
Helminthic fever (including bilharziasis).
Leishmaniasis (kala-azar).
Trypanosomiasis.
Typhus.
Blackwater fever.
Fever accompanying intestinal catarrh (cholera, etc.).
Yellow fever.

The above list, by no means complete, brings out the necessity for some routine method of examining cases of pyrexia.

Every case should be investigated in the following order :—

Full clinical examination.

Laboratory tests.

An accurate record of temperature of patient should be kept, including the effect of drugs, such as quinine, on the course of the fever.

2. *Clinical Observations.*—Particular attention should be paid to :—

(a) Skin and conjunctivæ for jaundice, pallor, ulceration, bites and rashes ;

(b) Lymphatic glands—size, tenderness, massing, adhesion ;

(c) Spleen—size and tenderness ;

(d) Liver—size and tenderness ;

(e) Stool—general characters of ;

(f) Urine for blood, albumin, bile and sugar.

3. *Laboratory tests* frequently give the most rapid means of direct diagnosis. A consultation of Table IV will show that a large number of fevers may be diagnosed or eliminated by such simple measures as blood smears, cultures or counts. Furthermore, it is evident that the sooner these investigations are undertaken the more likely is the causal organism to be found. Nothing is to be lost by the taking of early blood smears and cultures, much is to be gained. Delay in establishing the correct treatment for the disease may lead to permanent injury or even be fatal.

Blood films and fresh specimens should always be collected on the first day of fever, and subsequently daily for three or four days in case of a negative result. In relapsing fever, the causal parasite is only found in the peripheral blood during the fever, so also at times in some cases of malaria.

In most diseases where there is a blood infection, the maximum chance of isolating the organism by hæmoculture is in the first day or so of fever. This is especially so in the spirochetal diseases such as Weil's disease, seven day fever and rat-bite fever. In typhoid and paratyphoid fever the organism usually disappears from the blood after the first week of the disease. *Bacillus dysenteriae* at times may be isolated from the blood stream, but only early in the disease.

Routine Procedure of Laboratory Tests to be adopted in every case of P.U.O.—The medical officer in charge of the case is responsible for the collection of the following material in all cases of fever. He must either collect the material himself or arrange for it to be done. Should the facilities not exist on the spot for the proper examinations to be made, the specimens must be forwarded without delay to the nearest laboratory.

(a) In every case of fever *a blood film must be made on the first day of disease*, or the first day that the case is seen by a medical officer. Should the film prove negative and the fever persist, further films should be collected for two or three days.

(b) *A blood culture must be made if the fever lasts more than 24 hours.* It is advisable to make the blood culture on the first day of the fever, but in every case of continued fever it must be collected *before the end of the first week.*

(c) When blood is withdrawn for blood culture a little should be set aside for agglutination (Widal) and complement deviation (Wassermann) tests. It is seldom that an agglutination test will be of much value until after the 5th to 7th day. Should blood films and cultures prove negative it is advisable to do an *agglutination test on the 10th day*; a further blood culture may be tried on that day also.

TABLE IV.
Table showing the rapidity with which many of the Fevers Occurring in Warm Climates may be correctly diagnosed with the aid of a Pathological Laboratory.

	Direct evidence of disease by identification of causal organism in				Indirect evidence of disease may be gained from		Further tests that may be applied.
	Blood Slide.	Blood Culture.	Fæces.	Urine.	Blood Count.	Blood serum agglutination.	
Malaria ..	1st day of fever.				{ Increase of hyalines. Pigmentation. Leucocytosis Neutrophilia. Eosinophilia		
Relapsing fever ..	Only during fever.				{ Leucopenia Lymphocytosis Leucopenia Eosinophilia.		Spleen puncture for parasite. Lymph gland or lumbar puncture for parasites.
Filariasis ..	Especially during fever.						
Leishmaniasis ..	With fever if at all.						
Trypanosomiasis ..	With fever						
Typhoid fever ..		1st day and for a week.	In 2nd-3rd week.	3rd week and after.	Leucopenia	After 10th day.	Diazo reaction for urine.
Paratyphoid A, B, C.		"	"	"	"	"	"

(d) *The fæces* should be examined for bacillary, protozoal and helminthic infection as early in the fever as possible, and the examination repeated daily for three days. The whole stool should be sent if practicable, otherwise any blood or mucus that may be present. In suspected cases of enterica the most likely time to isolate the organism from the fæces is in the 2nd or 3rd week.

(e) The urine should be examined at once for albumin, blood, T.B. or ova of bilharzia. The best time to look for *Bacillus typhosus* and *Leptospira icterohæmorrhagiæ* is in the 2nd to 4th week of the disease.

4. *The Recording of Temperatures* often gives a very valuable indication of the disease suffered from. The accurate taking and charting of the temperature must never be omitted. For convenience of description the temperature charts are considered under the headings :—

(a) Morning and evening charts.

(b) Four hourly (or two hourly) charts.

(a) *Morning and Evening Charts* are helpful in depicting the tertian, quartan or quotidian periodicity of malaria ; the 2 to 3 day fever of phlebotomus or sandfly fever ; the 5 to 7 day fever of dengue (saddle back type) ; the weekly recurrent waves of relapsing fever ; and three-weekly recurrent waves of undulant fever, and so on.

(b) *The two to four-hourly Chart* shows the highest point of fever in the twenty-four hours. Broadly speaking, the temperature in malaria reaches its climax between 10 a.m. and 2 p.m. ; in undulant fever between 2 and 4 p.m. ; in enteric fever and sepsis between 4 and 6 p.m. ; in liver abscess between 6 and 8 p.m. ; and in syphilitic fever between 8 and 10 p.m. ; while in kala-azar and relapsing fever there may be a double rise in the twenty-four hours.

5. *Type of Onset and Termination of Fevers.*—Great attention should also be paid to the type of onset and termination of the fever. The following short tables exemplify this :—

(a) *Diseases with Onset showing a sudden Rise of Temperature.*

Malaria.

Relapsing fever.

Dengue.

Weil's disease, or leptospirosis icterohæmorrhagica.

Plague.

Typhus.

Trench fever.

Influenza.

Pneumonia (lobar).

Blackwater fever.

Bacillary dysentery.

Paratyphoid "A", at times.

Sandfly or phlebotomus fever.

(b) *Diseases with Onset showing gradual Rise of Temperature.*

Typhoid.
 Paratyphoid.
 Malta, Mediterranean or undulant fever.
 Rat-bite fever.
 Trypanosomiasis.
 Liver abscess.
 Kala-azar.

(c) *Fevers terminating by Crisis.*

Malaria.
 Sandfly fever.
 Dengue.
 Relapsing fever.
 Blackwater fever.
 Pneumonia (lobar).

(d) *Fevers terminating by Lysis.*

Typhoid.
 Paratyphoid.
 Weil's disease or leptospirosis icterohæmorrhagica.
 Bacillary dysentery.
 Undulant fever.
 Liver abscess.
 Kala-azar.
 Trypanosomiasis.

G.—GLYCOSURIA

779.—1. Glycosuria may be of very serious or of minor importance. What is of greater significance is the percentage of glucose in the blood. The problem is to diagnose the cause and type of any case of glycosuria; whether it be an instance of true diabetes mellitus, or one of the various other conditions associated with the symptom glycosuria. Broadly speaking, only 20 per cent. of all cases of glycosuria are due to diabetes mellitus.

2. *Clinical Observations.*—The commoner types of glycosuria are :—

- (a) renal ;
- (b) hepatic (including alcoholism) ;
- (c) alimentary ;
- (d) nervous ;
- (e) septic ;
- (f) endocrine, which includes particularly diabetes mellitus as well as the glycosuria associated with exophthalmic goitre and acromegaly.

All these glycosurias, except the endocrine variety, can be more or less cured or alleviated; most, in fact, are of minor importance.

Patients complaining of abnormal hunger, thirst, frequency of micturition, wasting, pruritus, boils, eczema, and ocular troubles such as phlyctenular conjunctivitis, iritis, and cataract should have their urine examined for sugar and ketone bodies (acetone). The presence of ketones is a more serious sign than the occurrence of sugar in the urine.

3. *Laboratory Tests.*—(a) A specimen of any urine giving a reduction or doubtful reduction of Fehling's solution should be sent to the pathological laboratory for confirmation or otherwise of the presence of glucose.

(b) All cases in which glycosuria is found should be sent to the laboratory for examination of the blood sugar content, with a view to establishing the true nature of the condition.

H.—HEADACHE.

780.—1. *Clinical Observations.*—Headache is a very common symptom which is often glossed over. Enquiry should always be made for any history of a crash or a head injury, and the memory tested for recent and past events. It should always be ascertained whether there are any associated symptoms suggestive of meningitis or encephalitis, and the eyes should be examined.

The site and type of pain frequently aid in diagnosis :—

(a) Frontal headache is seen with abnormal ocular conditions, dyspepsia, constipation, sinusitis, coryza, nephritis and fevers.

(b) Vertical headache is seen especially in neurasthenia and pelvic disease.

(c) Parietal headache may accompany lesions of the ear.

(d) Occipital headache frequently indicates meningitis or syphilis; in the latter case it is often worse at night.

(e) Headaches showing regular periodicity are suggestive of malaria, and the effect of quinine should be tried.

2. *Laboratory Tests.*—Depending upon the accompanying symptoms it will frequently be found advisable to forward material to the laboratory to aid in the establishment of a diagnosis—e.g., blood smears for malaria, blood serum for syphilis, cerebro-spinal fluid for meningitis.

I.—IRITIS.

781.—1. *Clinical Observations.*—In cases of iritis or iridocyclitis the possibility should be borne in mind of venereal disease, rheumatism, relapsing fever, bacillary dysentery, trypanosomiasis, diabetes and oral sepsis.

2. *Laboratory Tests.*—In cases of iritis it is advisable to carry out the following tests as a routine :—

- (a) Wassermann test.
- (b) Examination for gonococci, especially after prostatic massage.
- (c) Examination of blood smears and wet preparations for parasites.
- (d) Agglutination of blood serum against the dysentery bacilli.

J.—JAUNDICE.

782.—1. *Clinical Observations.*—Jaundice is not a disease, but only a symptom of many pathological conditions. Clinically, jaundice may be grouped into three types—(a) obstructive; (b) non-obstructive or hæmolytic; (c) toxic and infective; the last named being in some degree a mixture of the first two.

Some of the diseases that are more commonly associated with the various types of jaundice are as follows :—

- (a) *Obstructive Jaundice.*
 - Gall-stones (enterica).
 - Helminthiasis (tape-worms, round-worms, flukes).
 - Tumour of the liver and adjacent organs.
 - Cholecystitis.
 - Amœbic abscess (rarely).
- (b) *Non-obstructive or hæmolytic Jaundice.*
 - Blackwater fever.
 - Pernicious anæmia.
 - Ancylostomiasis.
 - Banti's disease.
 - Splenic anæmia.
- (c) *Toxic and infective Jaundice.*
 - Yellow fever.
 - Weil's disease or leptospirosis icterohæmorrhagica.
 - Malaria.
 - Relapsing fever.
 - Enterica (including "Camp Jaundice").
 - Epidemic catarrhal jaundice.
 - Typhus.
 - Scarlet fever.
 - Snake bite.
 - Arsenical poisoning.
 - Congestion of liver.

2. *Laboratory Tests.*—(a) The urine should be examined for urobilin and bile pigments.

(b) The blood serum subjected to the Van den Bergh test which may materially aid in the diagnosis of the type of jaundice.

K. —LARYNGITIS

783.—1. *Clinical Observations.*—In cases of persistent or progressive laryngitis or altered tone of speech a laryngoscopic examination for tuberculosis should always be made.

2. *Laboratory Test.*—In all such cases a sample of sputum should be sent to the laboratory without delay.

L.—PAIN IN RIGHT SIDE OF ABDOMEN

784.—1. *Clinical Observations.*—Pain in this region may be due to many causes, not only to affections of organs directly underlying this region, but to more distant structures, such as the right pleura and lung.

Before arriving at a diagnosis of appendicitis, care should be taken to eliminate such conditions as colitis (especially amœbic), enteric fever, constipation, biliary affections, duodenal ulcer, lobar pneumonia and pleurisy, in all of which pain in the right side of abdomen may occur early in the disease.

The diagnosis may be simplified by paying attention to the exact site and nature of the pain, and its relation to food, posture and movements; by the presence or otherwise of areas of tenderness to pressure; and by noting any associated symptoms such as jaundice, blood-stained sputum, or abnormality of stools.

2. *Laboratory Tests.*—In certain cases laboratory methods will aid in the establishment of a correct diagnosis and any material collected should be forwarded without delay.

M.—RIGORS

785.—1. *Clinical Observations.*—Rigors may herald the onset of many acute septic conditions—septicaemia, pyæmia or sapræmia; they usually accompany the passage of a biliary or renal calculus. Recurrent rigors often occur in malaria, but liver abscess may show similar symptoms. The rigors of malaria frequently occur before mid-day, and are accompanied by the presence of the plasmodium in the blood; whereas, in liver abscess the rigors take place usually in the evening, and may be associated with pain in the region of the right shoulder, and with the presence of *Entamœba histolytica* in the stools.

X-ray examination is of value in detecting liver abscess and calculi.

2. *Laboratory Tests.*—In every case an attempt should be made to complete the diagnosis by means of such aids as blood counts for leucocytosis; blood smears and cultures for the presence of parasites; the urine for passage of blood and calculi; the fæces for protozoa and gall-stones.

N.—VOMITING

786.—1. *Clinical Observations.*—The act of vomiting is governed by a centre in the medulla, which may be stimulated directly by increased cerebral pressure or by toxic bodies in the blood stream, and indirectly by reflex action from various abnormal conditions of distant organs.

In every case of vomiting a thorough clinical examination must be made and the vomitus inspected as to the condition of food and presence of blood, bile, etc. Lumbar puncture is a most valuable aid in the early diagnosis of meningitis in which vomiting is frequently an early symptom. Radiographic examination after an opaque meal should be performed when indicated. In gastric crisis the eye should be examined for pupil reflexes and retinal hæmorrhages.

Vomiting due to gastric disease is usually related to the taking of food and is accompanied by nausea; the vomiting associated with intra-cranial lesions often occurs suddenly and without nausea.

Common causes of vomiting are :—

- (a) meningitis and increased intra-cranial pressure ;
- (b) toxæmias such as occur with diabetes mellitus, nephritis, many fevers (including malaria), and alcoholism—these conditions have other symptoms to help in the diagnosis ;
- (c) gastric ulcer, leading to relief of the pain ;
- (d) gastric cancer, in which the vomitus often contains blood and is foul smelling ;
- (e) gastric crises of syphilis and pernicious anæmia ;
- (f) cholera, in which the vomiting is prolonged and associated with diarrhœa ;
- (g) food poisoning ;
- (h) renal and biliary colic, which are often followed by albuminuria and jaundice respectively ;
- (i) hernia, especially of the Richter type ;
- (j) enlarged uvula ;
- (k) cervical adenitis ;
- (l) pelvic disease ;
- (m) neurasthenia.

2. *Laboratory Tests.*—(a) A specimen of the vomit with full details of the case should immediately be sent for examination.

(b) When necessary, for purposes of differential diagnosis, a test meal should be done.

(c) Cerebro-spinal fluid should be examined *early* where meningitis is suspected.

(d) With concomitant diarrhœa, fæces should be sent for examination.

(e) Blood smears should be sent for examination for parasites and general blood picture.

(f) In all cases it is well to send a specimen of urine for examination.

CHAPTER XI

EPILEPSY AND ALLIED DISORDERS

825. It is essential to bear in mind that the term Epilepsy does not constitute a disease entity, nor is the usual syndrome of unconsciousness and convulsion the only form in which it exhibits itself. The diagnosis covers a symptom complex, of which the manifestations are widely varied, and the aetiology is often obscure. Its common characteristic is a sudden, transient, and recurrent disturbance of nervous function. This may occur at any physiological level of the nervous system. It may remain localized, or spread, and may appear excitatory or inhibitory. When the highest functional level is implicated, loss, or disturbance, of consciousness results. Involvement of motor centres is exteriorized as a convulsive paroxysm. Sensory and autonomic centres may be equally affected. The clinical picture which may be presented by different cases is therefore capable of wide variation.

From the practical point of view it is necessary to recognize the primary importance of any such sudden disturbance of nervous function, particularly when normal consciousness is disturbed. The most careful investigation is called for and it is a grave error to dismiss lightly any such case as one meriting little attention because no major convulsion, no tongue biting, nor micturition occurred. Failure to appreciate the significance of minor symptoms may lead to disastrous results.

A patient who is liable to suffer from such attacks may be deprived of consciousness, or volition, in a situation where such incapacity renders him liable to injure himself or others. The risks involved among personnel whose duties take them into the air, among machinery, or explosives, hardly needs to be stressed.

The questions of aetiology and pathology assume importance, since upon their correct assessment depends prognosis, and the provision of suitable treatment. Such decisions can be reached only after a complete investigation, and for this purpose any suspicious case must be admitted to hospital.

826. Aetiology.—The occurrence of any paroxysmal manifestation at once raises the question of its causation. All such "attacks" must be *symptomatic* of some underlying nervous dysfunction or disease, but in the present stage of knowledge no cause can be determined in a large proportion of cases, even after full investigation. To this group the term "*idiopathic*" is applied.

Among the identifiable conditions of which a "convulsion" may be symptomatic are :—

1. Injury or disease within the skull—such as meningitis, encephalitis, cerebral tumour, vascular disturbances (e.g. arteriosclerosis, embolism or aneurysm), syphilis, cysticercosis.

2. Endogenous toxæmia—such as that of uræmia, or acute infections, including malaria and tetanus.

3. Exogenous convulsant poisons—strychnine, alcohol, lead and cocaine.

The "fit" may occur as the earliest symptom of disease, e.g. in cerebral tumour, before other confirmatory evidence is available. A diagnosis of idiopathic epilepsy may have to be reversed in the light of subsequent developments, e.g. tumour or cysticercosis.

827. Manifestations.—1. *Major attacks.*—Typically there is an abrupt loss of consciousness, sometimes preceded by a cry, the patient falling heavily to the ground. (Enquiry subsequently may reveal the presence of some aura, or warning. This should be regarded as part of the fit itself.) The motor phenomena appear as a tonic spasm of the limbs, head and trunk, followed by a phase of clonic movements. Unconsciousness is usually prolonged for a variable period, during which the patient lies in a collapsed, and motionless, condition. Recovery is usually fairly rapid, though the patient may feel dazed. Often there is a tendency to suffer from headache, and to sleep after the attack—two important corroborative facts in a doubtful case. The occurrence of tongue biting, frothing at the mouth, or involuntary micturition are by no means essential to establish the diagnosis, but should always be a subject for investigation and record. Rarely, the phase of motor over-activity, constituting the convulsion, is replaced by one of motor inhibition. The patient lies motionless, relaxed and pallid.

2. *Minor attacks.*—These are usually of brief duration, lasting only a few seconds. Consciousness is clouded in the milder cases, but may be lost. Motor activity is suspended, but the patient rarely falls. The posture of the moment is maintained, the expression may become blank or bewildered, and pallor may develop.

Almost immediately he resumes the activity upon which he was engaged, and may subsequently be unaware that an attack has taken place. (This is a useful distinguishing point in differential diagnosis from a "faint".)

The importance of the minor attack is its usual association with major attacks. These may not, however, appear till later in life. Appropriate treatment may minimise the likelihood of their subsequent development.

3. *Automatism*.—A period of automatism of variable duration may follow a major or minor attack. In this state the patient may perform simple acts, or complicated and extended actions, in an apparently normal manner, without any subsequent recollection of these activities. Where this state occurs after a minor attack, recognition of the fact may be extremely difficult. Legal questions as to responsibility for actions may be involved, *e.g.* cases of desertion on active service. To confirm the diagnosis, a history of previous attacks is usually held to be essential.

4. *Jacksonian attacks*.—It is a common error to classify any fit occurring after a head injury as Jacksonian, using the term as synonymous with Traumatic Epilepsy. This is not strictly correct. It is true that Jacksonian attacks may follow a localized trauma of the cortex, but they also occur in non-traumatic cases, and are due to some organic brain lesion, such as a neoplasm.

The qualification " Jacksonian " should be limited to describe a certain type of attack, of which the essential feature is the fact that it commences locally, *e.g.* in the thumb or angle of the mouth. It may remain as a localized spasm or twitching, or may spread, by a definite line of march, to other parts, *e.g.* up the arm and down the leg of one side. Consciousness may be retained, or lost when the attack terminates in a generalized major convulsion. The diagnostic criterion is the focal origin, and the orderly and progressive spread of the convulsion by a path which corresponds to the juxtaposition of the centres in the motor cortex. The starting point may afford valuable information as to the site of the exciting lesion, as in the case of a tumour.

5. *Traumatic epilepsy*.—This term is applied more widely to include those attacks of a major or minor nature following an injury to the head, which do not conform to the Jacksonian type.

6. *Epileptic Variants*.—Other less common conditions, often referred to as epileptic variants, are as follows :—

(a) *Narcolepsy*.—This is characterized by the occurrence of sudden attacks of sleep, usually of short duration, which the patient is unable to resist. Convulsion is absent.

(b) *Pyknolepsy*.—This occurs only in children, in the form of " minor " attacks, occurring in large numbers during the day.

(c) *Catalepsy*.—This takes the form of a prolonged trance-like state, closely resembling prolonged natural sleep.

(d) *Catalexy*.—In these attacks there is a sudden loss of voluntary power, usually under the influence of emotion. The patient may drop any article he is holding, or sink gradually to the ground, usually without any disturbance of consciousness. The attack is of short duration.

828. Diagnosis.—1. Experience has shown a tendency to attach too little importance to the occurrence of attacks of minor disturbances of consciousness. A diagnosis of a "faint" has been often arrived at, without the necessary consideration, and exclusion by investigation, of other possible causes of more serious import. The true significance of the symptom passes unrecognized until the occurrence of a major fit. The problems to be solved fall under two main headings:—Firstly, to distinguish epilepsy from other paroxysmal attacks which resemble it to some extent. Secondly, to decide whether an epileptic attack is of the symptomatic or idiopathic variety. It is the attack in which consciousness is disturbed without convulsion, or where a convulsion did occur but was not witnessed, which presents the greatest difficulty in diagnosis. The occurrence of a convulsion implies the existence of some form of epilepsy, and is sufficiently dramatic to ensure due attention. The question whether it is symptomatic or idiopathic can only be satisfactorily decided by a thorough investigation in hospital. The absence of positive findings justifies a tentative diagnosis of idiopathic epilepsy.

2. The following points are in favour of such an origin:—

(a) A history of previous major, minor, or nocturnal attacks. The possibility of nocturnal fits must always be the subject of investigation. Fits may occur in the sleeping state only, or over a long period by night before they make their appearance by day. Nocturnal enuresis of otherwise unexplained origin may be the only clue.

(b) A family history of fits, or of nervous or mental instability.

(c) The presence of an aura, and the abruptness of incidence of the attack.

(d) The definite presence of the tonic-clonic phases.

(e) Tongue biting and loss of sphincter control.

(f) The prolongation of unconsciousness for more than a few minutes (unless a fall introduces a further element of concussion, or status epilepticus develops).

(g) The occurrence of headache, drowsiness, or mild confusion after the attack.

(h) Any alteration of pupils or reflexes, such as a transient extensor response.

829. Differential Diagnosis.—Paroxysmal attacks, which may simulate epilepsy or its variants, are:—1. *Syncopal attacks.*—These are most likely to occur in certain well recognized settings, e.g. in hot stuffy rooms, in church or on parade, or on getting up after illness. The onset and recovery are more gradual. Premonitory symptoms, which must be

distinguished from the epileptic aura, occur in the form of restlessness, sweating and blurring of vision. Flaccidity is present. Any rigidity is in favour of an epileptic origin. Consciousness fades more gradually. There is no recollection of the attack. In epilepsy the fall, at least, is rarely remembered.

2. *Vaso-vagal attacks*.—These include a somewhat vague syndrome resembling an incipient faint, but usually without complete loss of consciousness. The patient finds it difficult to pay attention. Symptoms take the form of a sense of oppression in the chest, palpitation, and a feeling of apprehension and insecurity. Vision is often "blurred." The patient feels incapable of movement, and lies down, only speaking with effort. The pulse may be found to be slow, with pallor and coldness of the skin. The blood pressure is commonly low. Other evidence of vagal over action, such as flatulence, or bowel action, may occur. The cause is held to be a vaso-motor disturbance, not necessarily vagal overaction. The distinguishing feature is the duration of the attack, which may last for an hour.

3. *Anxiety attacks*.—These are unaccompanied by disturbance of consciousness. They are attended by motor restlessness, which serves to distinguish them from vaso-vagal attacks. The patient feels acutely anxious, sweats, and suffers from palpitation. Enquiry usually reveals an emotional origin.

4. *Hysterical attacks*.—These may be manifested by a loss of consciousness or a convulsion, which consists of semi-purposive and co-ordinated movements, never the typical tonic-clonic phases of epilepsy. The picture typifies a dramatic emotional storm. Tendon reflexes are exaggerated, plantars are unaffected.

5. *Meniere's syndrome*.—This may cause a sudden fall, without consciousness being affected. A history of vertigo, deafness or tinnitus is usually obtainable.

6. *Stokes Adam's disease*.—This is more common in later life, and its presence will be revealed by the electrocardiogram.

830. *Investigation*.—1. The investigation of a case is carried out by a study in detail of the past medical history, by a complete physical and neurological examination, and by a pathological overhaul, with particular reference to the Wassermann Reaction in blood and cerebro-spinal fluid. Skiagrams of the skull and electrocardiograms should also be obtained.

2. *Procedure*.—It is of the utmost importance that the patient should be questioned closely, *as soon as he has recovered consciousness*, as to the incidence of previous similar attacks,

and as to his family history. Otherwise he may have realized fully the gravity of his position, by the time he reaches hospital, and fail to disclose any information damaging to his future career in the service.

It is essential that, when sent to hospital, the case should be *accompanied by a detailed report, furnishing all particulars of the attack.*

It must be recognised that the diagnosis will often have to be decided solely on the history, since opportunity for observation of an attack in hospital cannot be relied on. As the whole future of the patient will depend upon a correct assessment of the nature of the attack, the importance of the report will be realised. One small detail may settle the diagnosis.

3. The particulars required should be obtained from (a) the patient himself after recovery (b) eye witnesses of the attacks in writing (c) the medical officer who first sees the case.

4. The headings under which the report should embody information are as follows :—

(a) Setting and circumstances in which the attack occurred.

(b) Whether the loss of consciousness was abrupt or progressive. Presence of aura, cry, fall, and any accompanying injury.

(c) Whether convulsion occurred. If so, whether general or localised. If the latter, its point of origin and its march, and, if unilateral, on which side. Any conjugate deviation of the eyes. Presence of tongue biting, or micturition.

(d) Appearance—pallid or cyanosed.

(e) Duration of unconsciousness. Whether recovery was abrupt or gradual.

(f) Presence or absence of headache, drowsiness, or other symptoms, after recovery.

(g) Clinical details, pulse, respiration, tendon reflexes, plantar and abdominal responses, pupil reactions.

831. Treatment.—1. *Of the attack.*—Little should be attempted except to :—

(a) Remove objects near the patient with which he might injure himself.

(b) Loosen the collar and clothing.

(c) Insert some suitable article between the teeth to obviate injury to the tongue.

(d) Otherwise interfere as little as possible with the patient.

On recovery the patient should be put to bed, and observed. Bromide of potassium or luminal should be given.

Where "status epilepticus" develops, a condition in which fits succeed one another without intermission, active treatment must be instituted. The urine should first be examined, since it may throw light on possible causation, and indicate appropriate treatment.

Bromide and chloral up to one drachm or paraldehyde, two to four drachms in four ounces of water should be given per rectum, or three grains of luminal-sodium intramuscularly, at once. Chloroform may be required.

Lumbar puncture should be performed.

2. *Subsequent treatment.*—The symptomatic variety will be dealt with according to the underlying condition. Idiopathic cases should commence a course of luminal, the dosage varying according to the frequency and severity of the attacks. They are instructed, on discharge from hospital and invaliding from the service, to seek medical advice immediately in order to obtain continuity of treatment. When a case is invalided, he should be provided with seven days interim treatment, since sudden cessation has been known to be followed by "status epilepticus."

832. *Disposal.*—All cases of epilepsy occurring among serving personnel definitely diagnosed as "idiopathic" call for invaliding. In certain other cases where the attack may be symptomatic of some transient illness, the patient may be retained in the service under medical observation. Recurrences will be dealt with by invaliding.

When the weight of evidence is in favour of a diagnosis of a "faint" or vaso-vagal attack, and the history and physical condition are satisfactory, it may be reasonable to retain the patient in the Service under observation on ground duties, and employed in a capacity where a disturbance of consciousness would not entail undue risk. Flying as pilot or passenger during the period of such observation is contra-indicated.

Any repetition of attacks must be viewed with considerable suspicion as to their real character, and will render the patient unfit for further flying.

833. *Cysticercosis.*—Recent work has established a causal relationship between the occurrence of epileptic attacks, with other anomalous nervous manifestations, and infestation with tape worms. In addition to the fact being of medical interest, this finding has an important bearing on the question of attributability of "fits" to Service, and the award of a disability pension. The possibility of the existence of this condition has therefore to be envisaged when dealing with any case of epileptiform attacks, particularly if the subject has been stationed abroad.

All patients should be questioned as to the history of any tape worm infection, and service overseas. Fits are held to be liable to occur at any time after such infection, but a long latent period is usual. This may extend over a period of which the limit is not yet certain. Examination should invariably involve a search for the presence of any typical nodules, which may be seen or felt under the skin, or in the muscles. Skiagrams of the skull, and all limbs should be taken as a routine measure in suspicious cases. The fact that cysts may not be demonstrated in the films does not necessarily exclude the possibility that fits are due to infection, since cysts do not show up until they become calcified, though effective in producing fits before this stage. For this reason all cases in which there are reasonable grounds for suspecting the presence of cysticercosis should be re-examined clinically and radiographically once a year for at least five years after being invalided from the Service.



CHAPTER XII

OPHTHALMIC NOTES

840. Ocular Injuries.—Foreign bodies may produce :—

1. Non-perforating wounds.
2. Perforating wounds or ruptures.
3. Burns and scalds.

1. *Non-perforating wounds* of the cornea, which destroy only epithelium, heal without a scar provided no complications, such as a corneal ulcer, arise. Wounds deeper than the epithelium leave opacities, which are permanent, their extent depending upon the area of substantia propria damaged.

Treatment.—Remove with the greatest possible care any foreign body which may be present. If it is embedded in the cornea, instil in each eye a drop of cocaine (one per cent. or an ophthalmic tablet of cocaine, and after washing the affected eye with boric lotion (10 grains to the ounce), remove the foreign body with an ordinary eye spud. In all cases continue the use of a mild antiseptic lotion three times a day until all signs of local reaction have disappeared. Where there is considerable damage to corneal tissue, dilate the pupil with atropin (1 per cent.), twice daily until the reaction has subsided, remembering that in people over thirty years of age atropin must be employed with caution.

2. *Perforating wounds and ruptures.*—Perforating wounds and ruptures may vary in character from an injury so small as to be found only on the closest examination to one so extensive that the eye is completely disorganized. Any one, or all, of the ocular structures may be involved, and the agent responsible for the injury may or may not be retained in the eye or orbit. Gentle handling, during examination and subsequent treatment, is necessary, for any undue pressure on a ruptured globe is liable to cause further damage to, and prolapse of, the ocular contents.

Treatment.—Repeated thorough washing of the conjunctival sac with normal saline, and the use of atropin drops (1 per cent.) three times daily can result in nothing but benefit. Protective dressings must exert only the lightest pressure. When the assistance of an ophthalmic surgeon cannot be obtained, a wound in the sclerotic, after disinfecting as far as possible with perchloride of mercury solution (1 part in 5,000), should be dealt with by drawing the cut conjunctival margins over the gap and stitching them together by means of silk sutures.

3. *Burns and Scalds* of the lids and ocular surfaces are met with most commonly in units where caustic potash and soda are extensively employed. Aeroplane accidents, accompanied by fire, account for a few.

The chief complications are two—

(a) Corneal ulceration.

(b) Symblepharon (adhesion between lid and ocular conjunctival surfaces).

Treatment.—The immediate treatment depends upon the irritant or corrosive causing the injury. Alkalis are treated with a wash of very dilute acid and *vice versa* (e.g. sodium bicarbonate lotion (3 per cent.) for acids, and milk or boric lotion for alkalis). In all cases repeated washings with normal saline should be employed, and where there is any danger of adhesion forming between the lid and ocular conjunctival surfaces, sterile olive oil must be instilled three times daily, the lids being widely separated during each administration. Unless the initial damage is obviously of a superficial nature, cases of burns and scalds of the eye should be transferred to hospital.

841. Ulceration of the Cornea.—This may follow any injury to its substance. If suspected, the instillation of an ophthalmic tablet of fluorescein will reveal the exact area of damage.

Treatment.—1. Wash out the conjunctival sac with a warm mild antiseptic solution three times a day.

2. Employ hot applications to the closed lids in the form of a wad of cotton-wool or flannel wrung out in water as hot as can be borne, every four hours and for a period of ten minutes at a time.

3. Use atropin drops (1 per cent.) three times a day.

4. Give the patient dark smoked glasses in mild cases, otherwise use a pad and bandage.

This treatment will generally effect a cure, but in the rapidly spreading ulcer with "hypopyon" (a layer of sterile pus in the anterior chamber caused by the violence of the reaction) sterner measures, such as the cautery or pure phenol, must be used. In using phenol, cocaine the eye, and after drying the ulcerated surface carefully with blotting paper, apply the phenol to the affected surface by means of a delicate brush or a pointed match-stick. Keep the lids separated until the phenol has had time to act and to dry, and then resume the treatment described above.

842. Blepharitis.—This is inflammation of the lid margins and is characterized by the presence of little collections of squamous material at the base of the lashes. A later ulcerated type also occurs. Refractive errors and tropical conditions are responsible for many cases, and must be remembered in connection with general treatment.

Local Treatment.—The “crusts” are removed with sodium bicarbonate lotion (3 per cent.) well warmed. When the lid margins are quite clean, rub yellow oxide of mercury ointment (1 per cent.) into the area affected, twice daily.

843. Conjunctivitis.—There are two important considerations to be borne in mind when dealing with cases of lid inflammation and general infection of the superficial vessels of the eye :—

1. Such condition may be extremely contagious.

2. The haphazard diagnosis of “Conjunctivitis” may result in lasting damage of an eye, in which the obvious conjunctival injection is but masking more serious disorders, such as glaucoma and iritis.

In order to minimise the possibilities of erroneous diagnosis under such circumstances, seven differential points are tabulated below.

—	Conjunctivitis.	Iritis.	Glaucoma (acute).
1. Superficial inflammatory changes.	Most marked on lids or sclerotic.	More marked in circum-corneal area.	Generally diffuse.
2. Blood vessels	Bright red in colour and mobile at circum-corneal area, blanching on pressure.	Some general redness, but circum-corneal area violet, non - mobile and not blanching on pressure.	General diffuse redness. Circum-corneal vessels may be affected, and if so do not blanch on pressure.
3. Cornea ..	Clear, except for occasional mucous flakes.	Clear	Substance hazy.
4. Iris and pupil	Unaffected ..	Iris pattern obscured. Pupil perhaps irregular and contracted.	Pupil oval (long axis vertical) and dilated.
5. Visual acuity	Unaffected ..	Slight reduction.	Markedly reduced.
6. Pain ..	Slight (so-called irritation).	Definite (except where syphilitic).	Very acute.
7. Intra-ocular tension.	Normal ..	Normal (excluding complications).	Increased.

Cases of iritis and glaucoma should be reported immediately for specialist treatment.

Treatment.—Cases of conjunctivitis call for treatment along the following lines, according to the nature and severity of the infection. In all acute cases, precautionary questioning as to the presence or recent history of gonorrhœa should be made. Where more than one case occurs at a time, smear preparations should be examined and appropriate measures taken to prevent the spread of infection.

1. *Acute Conjunctivitis.*—(a) *Simple.*—The *purulent*, *mucopurulent* or *mucoid* varieties are best treated by washing out three times daily with a lotion of zinc sulphate and chloride ($\frac{1}{2}$ grain of each to the ounce of normal saline), and, if severe, by painting the everted lids daily with a solution of silver nitrate (1 per cent.).

(b) *Contagious* ("pink eye").—This variety, caused by the Koch-Weeks bacillus, reacts after a time to repeated washings with a lotion of hydrargeri perchloridi (1 part in 7000), and in cases where the acute symptoms have passed away, the use of a solution of silver nitrate (1 per cent.), as a paint brushed over the everted lids, hastens recovery.

2. *Angular Conjunctivitis.*—This is characterized, as its name implies, by inflammatory changes confined chiefly to the inner and outer canthi, and it yields rapidly to washings out with a lotion of zinc sulphate and chloride ($\frac{1}{2}$ grain of each to the ounce of normal saline) three times daily.

3. *Gonorrhœa Ophthalmia.*—This is a most serious type of conjunctival infection, and so fulminating may be its progress that diagnosis scarcely calls for a history of urethral discharge, or of infection through the medium of towels or other property of a known sufferer.

In the first instance, one eye is usually attacked; in these circumstances, isolate the other eye immediately by means of a suitable adhesive plaster shield containing a glass window, with the only means of air-inlet on the outer side.

While arrangements are being made to bring the case under the care of an ophthalmic surgeon, wash the affected eye thoroughly every two hours with normal saline and apply hot dressings to the closed lids. Silver nitrate (five to ten grains to the ounce) is valuable as a paint to the everted lids in the early stage before œdema and stasis render its application unsuitable. All attending these cases should exercise the greatest care in protecting their own eyes from infection.

4. *Chronic Conjunctivitis.*—Although text books should be consulted when dealing with special cases, the following general routine treatment is valuable :—

(a) In employing lotions, eliminate the usual "eye cup" and proceed as follows :—Place the patient on a couch and



with a piece of cotton-wool damped with the prescribed lotion clean the area of skin bounded by the orbital margins of the closed lids. Next, from cotton-wool squeeze a quantity of lotion into the depression made by the orbit and bridge of the nose, so that a pool of lotion is formed. The patient now opens his eye, and retracting the lids, moves his eye in and out and up and down, thus effecting thorough contact between the lotion and the conjunctival surfaces.

(b) One or more paintings daily with silver nitrate (five grains to the ounce), will always accelerate the cure of the more resistant chronic cases.

844. Precautions in the Use of Cocaine and Lead Lotion.—

The use of cocaine, other than as an anæsthetic for operative work, is harmful. It should never be used to alleviate pain whilst examining or washing out an eye, as it has the effect of devitalising the corneal epithelium. The use of lead lotion as an application in the treatment of black eye, etc., is contra-indicated, for should an injury to the cornea be present a deposit therein of white lead results, which may seriously and permanently impair visual acuity.

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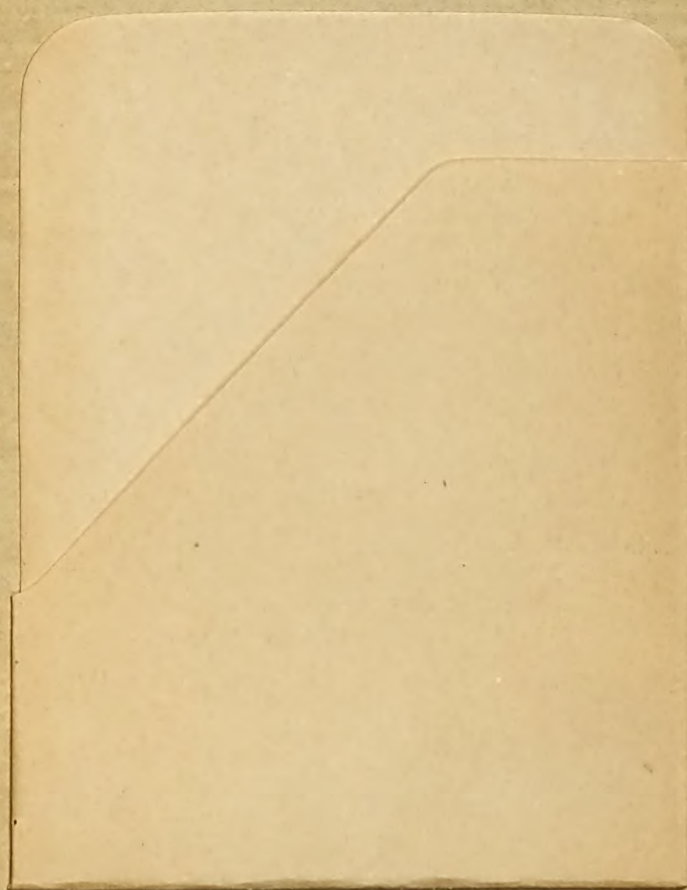
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